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ABSTRACT

This report attempts to identify the relevant environmental factors which have an impact upon the quality of life of the child. The following are discussed: (1) introduction--population growth, population growth and natural resource reserves, GNP and the quality of life, regulation of population size, population quality; (2) prenatal consideration--prenatal supervision and care, nutrition, placental abnormalities, intrauterine infections, drugs, maternal disease, environmental stress, subpopulations, physicians suggest improvements for consumers and systems, public service vendors; (3) perinatal and postnatal considerations--labor and delivery, neonatal period (risk factors, prediction impairment), social considerations during infancy (illegitimacy and its consequences, parental deprivation, abuse and neglect, other influences upon emotional and social development), prelinguistic development and influencing factors, motor development and related factors, nutrition, the service pattern and physicians' comments, and public vendors. (KM)

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U. S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE

THE PRENATAL, PERINATAL, AND POSTNATAL STATUS OF CHILDREN IN IDAHO

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THE PRENATAL, PERINATAL, AND POSTNATAL STATUS OF CHILDREN IN IDAHO

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A portion of this report is submitted as required to the

WESTERN INTERSTATE COMMISSION FOR HIGHER EDUCATION

and to

THE IDAHO OFFICE OF CHILD DEVELOPMENT

PS 006148

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PREFACE

The following three chapters represent part of a comprehensive report which will be issued by June 31, 1973. This part of the report has been prepared and released in advance because it was the feeling of our staff that the information contained within the report is vitally necessary for the planning of comprehensive service systems.

The report is ecological in nature i.e. it attempts to identify the relevant environmental factors which have an impact upon the optimal outcome of the child (the quality of life). Knowledge of the relevant factors, the time of their occurrence and their potential impact are necessary elements in planning optimal environments and preventative strategies.

The recommendations at the end of the report are based upon information drawn from a number of sources including obstetricians, pediatricians, hospital records, public agencies, and private agencies throughout the State of Idaho. Other information was also obtained by reviewing relevant literature and child development studies. Critical environmental factors, which determine needs, are enumerated in the report as are the services necessary to meet the needs.

Monitoring and evaluative procedures have also been recommended as essential elements in determining the supportiveness of the service environment.

It is our hope that this report will in some way help enhance the quality of life for children in Idaho. They are the resource upon whom the State of Idaho will ultimately depend.

Howard Schrag, Ph.D.

Introduction

Population Growth

It is almost redundant to state that the future will bring extensive change. Three major factors traditionally considered outside the domain of child development are likely to have an extensive influence upon the way in which children are treated, valued, and brought up during the next several decades. The three factors include population growth, natural resource utilization, and the concept of the quality of life. In planning for children, consideration of factors such as the above is paramount.

The world population (Figure 1, Boughey, 1968) remained relatively stable with a slight increase from the birth of Christ up until about 1750. At that point it began to rise moderately, and by 1900 the world population was increasing at an ever-accelerating rate.

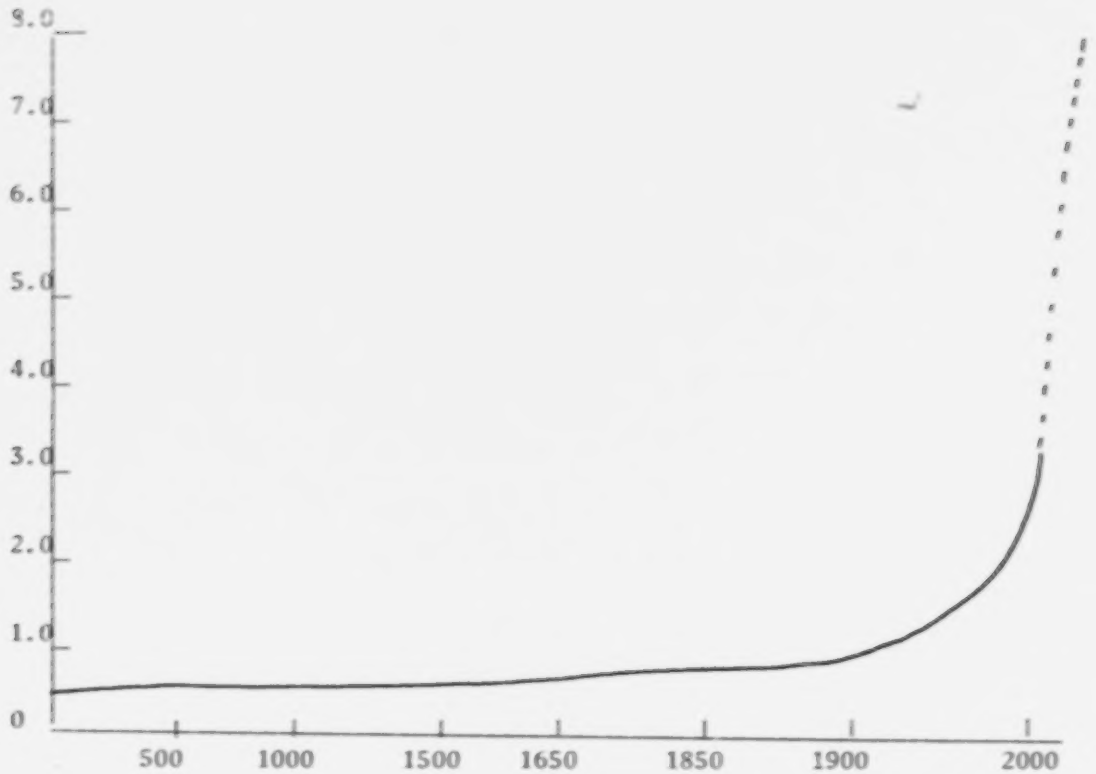


Figure 1. World population in the first two milleniums of the Christian Era. Figures represent billions of persons. The dotted portions of the curve represent estimates of what happened before records were available and what may occur in the near future if present rates continue. (Boughey, 1968)

Table 1 (Boughey, 1968) gives the number of years required to double the world population during various times in the Christian Era. It also contains the population figures for the various years. This table is another way of presenting information similar to that observed in Figure 1.

TABLE 1

Number of Years Required to Double the World Population at Various Dates in the Christian Era (Boughey, 1968).

YEAR	POPULATION (Billions)	NUMBER OF YEARS TO DOUBLE POPULATION
1	0.25	1,650
1650	0.50	200
1850	1.1	80
1930	2.0	45
1975	4.0	35
2000	8.0	?

(After H.F. Dorn in Science, 135:283-290 (Jan. 26) 1962. Copyright 1962 by the American Association for the Advancement of Science).

The population of the world is doubling during shorter periods of time. Figure 2 (Rockefeller 1972) shows the rate of population increase from 1870 to 1970 in the United States. During this period of time, the United States passed the one hundred million mark in 1915 and reached the two hundred million mark in 1968. In addition, the graph shows the population characteristics which may be obtained by the United States if three children families or two children families become reality. If families average two children in the future, population growth will slow and the

population will reach about three hundred million in the year 2015. However, if the three child rate is common, the population will reach the three hundred million mark in this century and the four hundred million mark in the year 2013.

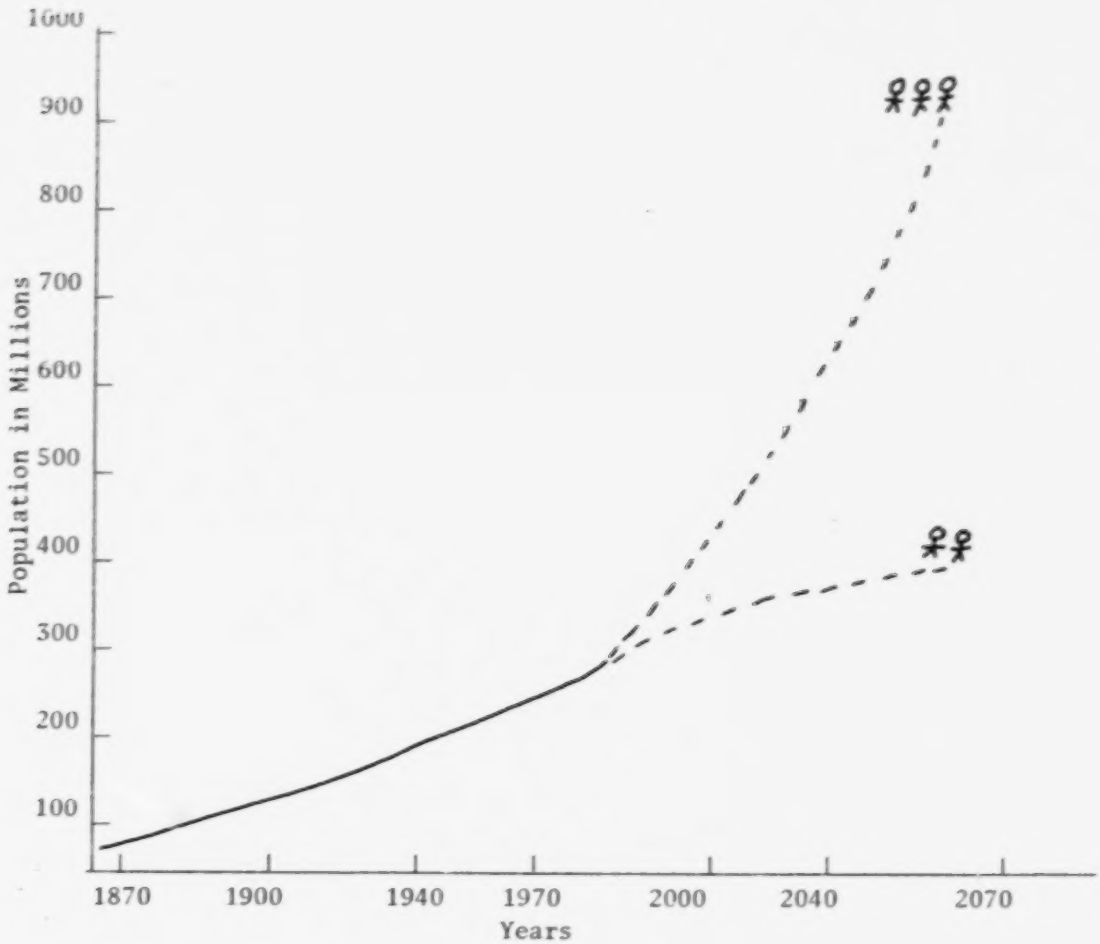


Figure 2. Sources: Prior to 1900-U.S. Bureau of the Census Historical Statistics of the United States, Colonial Times to 1957, 1961. 1900 to 2020-U.S. Bureau of the Census, Current Population Reports, Series P-25. 2021 to 2050-unpublished Census Bureau projections. Beyond 2050-extrapolation

Figure 3 (Rockfeller, 1972) shows the average fertility rate per woman starting at 1800 and going to 1970. It can be observed from this graph that during the year 1800, seven children per family constituted the average family size. This figure dropped until 1970 when it reached an average of about two and one-third children per family. Data obtained from the census figures and from projection studies done by the Idaho Water Resources Board (Wells, Jeffery and Patterson, 1969) indicates that our total population for Idaho will be around nine hundred thousand by 1980 and almost a million by the year 2000. By the year 2070, the population will reach two and three-quarter million.

Figure 3. Total Fertility Rate (Children per woman)

Data obtained by Vital Statistics for Idaho births was converted to the number of children per family using the census bureau formula. Figure 4 contrasts the number of children per family in the United States and in Idaho. As can be seen from the graph, birth rates per family for Idaho residents have exceeded the national average for almost the last five decades. In addition to the higher birth rate in Idaho, we now have more immigrants than emmigrants. The reversal which began this trend appears to have occurred sometime during 1968 or 1969 (Wick, Janet, 1972).

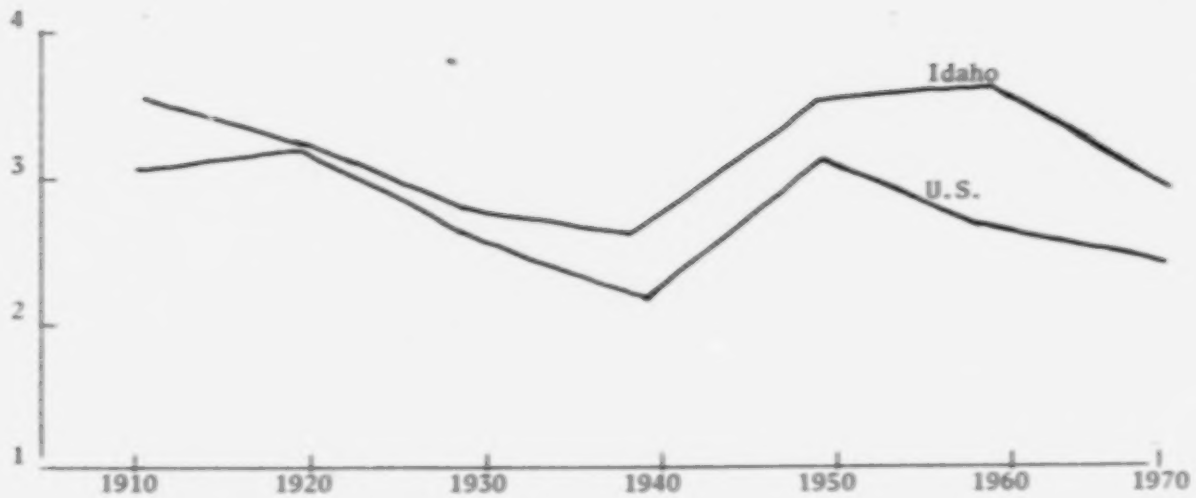


Figure 4. Comparison of the U.S. fertility rate and the Idaho fertility rate.

Population Growth and Natural Resource Reserves

Population growth and its interaction with the availability of natural resources has been a topic of discussion for some time. Malthus was one of the first to discuss population and its potential impact upon man and the environment. There is really no dating of the beginning of the debate. John Stuart Mills, Barry Commoner, and Paul Ehrlich among others, tried early to get the debate going; but perhaps the first three months of 1970 marked the real beginning in terms of a large-scale involvement of many people, including some with great prestige.

In January of 1970, the British Journal THE ECOLOGIST published Blue Print for Survival, a mainly conceptual exposition of the world crisis its authors foresee. The article Blue Print for Survival was written by thirty-three prominent scientists who endorsed its broad conclusions. Then on March 2, the Club of Rome and MIT systems specialist, Dennis L. Meadows introduced The Limits to Growth to a large audience for the first time. The symposium held in the original Smithsonian Institute Building brought together advocates on both sides of the debate and delineated their broad positions clearly. While various positions at the symposium were expressed, they did find agreement upon two major issues. First, unlimited growth cannot go on: second, large-scale changes in man's use of materials are needed. Basic to these two conclusions is the premise that man lives within a closed system, and within this system there exists an optimal level of population growth. The major points of disagreement were centered around what the optimal level might be and when it might be reached. MIT projections are based upon a new field of study underlying some of the more sophisticated uses of modern computers. Its purpose is to construct mathematical models of some part of the real world or in this case the entire world.

A basic premise of the new science is that everything is related to everything else and that one factor such as industrial growth can effect every other aspect of the world in ways often hithertofore unperceived. It is a nonlinear science. It recognizes that the multitude of possible effects from interacting factors can be exponential in both negative or positive ways through feedback loops. Some of the major elements considered in the MIT projection included resources, food per capita, population, industrial output per capita, and pollution. The resultant projection indicated population stabilization during the twenty-first century. However, a population crash would appear to be inevitable by the twenty-second century.

Where figures on the availability and remaining quantities of non-renewable resources could be obtained or estimated, the MIT group used them. Some of the resources are listed below in Table 2 (Gilluly, 1972).

TABLE 2

Some Nonrenewable resources: at current rates of use (3) and with projected exponential increases (6).

Resources	Known Known Global Reserves	Static Index (years)	Projected Rate of Growth (%per year) High Av. Low	Exponential Index (years)	Exponential Index Calculated using 5 times known Reserves (years)
Aluminum	1.17×10^9 tons	100	7.7-6.4-5.1	31	55
Chromium	7.75×10^8 tons	420	3.3-2.6-2.0	95	154
Coal	5×10^{12} tons	2300	5.3-4.1-3.0	111	150
Cobalt	4.8×10^9 lbs.	110	2.0-1.5-1.0	60	148
Copper	308×10^6 tons	36	5.8-4.6-3.4	21	48
Gold	353×10^6 troy oz.	11	4.8-4.1-3.4	9	29
Iron	1×10^{11} tons	240	2.3-1.8-1.3	93	173
Lead	91×10^6 tons	26	2.4-2.0-1.7	21	64
Manganese	8×10^8 tons	97	3.5-2.9-2.4	46	94
Mercury	3.34×10^6 flasks	13	3.1-2.6-2.2	13	41

It gives the known global resources, their utilization per year, their projected rate of use, and an index indicating the number of years the resource reserves may hold out providing five times the known amount of resources are discovered.

Another consideration related to the resources available for utilization in the future is the consideration of fuels or potential energy sources. An example of this is a review by Inglis in 1970 relating the amount of uranium resources available for generating atomic energy. It should be pointed out that uranium is one of the newest fuels and also one about which information is available because most of the deposits are known. V.E. McKelvey, Director of the United States Geological Survey, (1972) has calculated that the amount of uranium available with suspected but undiscovered reserves included, is sufficient to supply the lifetime needs of reactors in use or ordered in 1968 and only half enough to meet the requirements of reactors expected to be in use by 1980. From figures like this, Inglis (1971) questioned the advisability of enlarging nuclear generating power plants for commercial use.

Until recently the only information available about petroleum resources consists of estimates prepared annually by the American Petroleum Institute (API) and the American Gas Association. A few years ago, however, the API began to report estimates of total oil in place and improved acreage. The Potential Gas Committee also began to estimate possible and probable reserves to be found in extensions of identified fields and discoveries in presently productive areas. They also introduced another category called speculative resources which is equivalent to undiscovered.

In 1970, the National Petroleum Company released a summary of a report on future petroleum providences of the United States. This report was prepared at the request of the Department of Interior, and the contents

of the report estimate crude oil reserves. In the report NPR indicated that twelve times as much oil remains to be discovered and produced as exists in proven reserves alone, however, they did not assess the cost of such recovery. The potential gas companies report indicated that about 8% of the natural gas originally in place is now recovered paramarginal and submarginal. Resources in the original gas reserves are not as large as for crude oil. The uncertainty concerning potential coal resources centers not only on their total magnitude, but on the amounts available at present prices. The United States Office of Science and Technology Energy Research and Demonstration and National Progress estimates that the amount of minable coal at present prices ranges from twenty billion to two hundred twenty billion tons. Twenty billion tons represents nearly a forty-year supply at the present rate of consumption.

Up to this point, we have been considering fuels which are secondary energy resources. The primary supply of energy is that of solar energy, and more scientists and engineers are beginning to believe that solar conversion may account for a significant proportion of the world's future power needs. The National Science Foundation budget for solar research which stood at one and four-tenths million in fiscal year 1972 would now stand at four million during the fiscal year 1973. There are two basic ways which are now being considered as methods of converting solar energy into usable power resources. The first consists of concentrating the sun's rays and using them to heat something and eventually boiling water to run a turbine. The other method is the photovoltic effect which depends upon the ability of certain crystals to generate an electric potential that will drive a current when a light shines on them. Applications of conversion of solar power to usable electricity have been made in satellite projects - an example

being the Apollo telescope mount. The cost for conversion from solar energy to kilowatt in this project was approximately two million dollars per kilowatt. (Thomsen, 1972) Hence, at this point in the development of the technology the price is high for the conversion of solar energy to usable electric power.

Meadow's MIT computer projections indicated that pollution, a byproduct of energy and resources utilization, may be a major factor in ultimately causing a population crash.

Pollution can take various different forms. William Heinrich (1971) told scientists at a recent American Cancer Society Seminar that studies he completed upon rats indicated that DDT can interfere with mammation reproduction. Additional DDT resulted in an increased incidence of ovarian cysts among female rats. In recent years, there has been evidence of increased ovarian cysts among young women. He theorized that DDT acted upon the hormonal system of young women causing more cysts than normally expected. For sometime it has been known that DDT can kill birds that eat crippled or dying insects sprayed with DDT.

Water pollution is another area of concern. Industrial waste and municipal sewer systems are the main contributors to waterway pollution. Because of this, the Environmental Protection Agency's Water Quality Office has launched a number of Research and Demonstration projects to work with the complexities of water pollution. (Cyrvin, 1971)

Another form of pollution is air pollution. Correlation between CO levels and overall deaths in Los Angeles County have proven to be positive. Other air pollutants such as nitrogen oxides have the same potential, yet have not been studied by the California State Department of Public Health (Hexter & Goldsmith, 1971).

Pollution is a complex problem and one which the MIT study related directly to population density and natural resource utilization. The greater the population, the more natural resources used and the greater the pollution control problem.

GNP and the Quality of Life

The third issue centers around the concept of quality of life, the GNP index, and the relationship between the two. The 138th meeting of the American Association for the Advancement of Science held in Philadelphia in December 1971 discussed the issue, "Can we Develop an Index on the Quality of Life?" Distinguished members of the panel included individuals from various social science disciplines including economics, anthropology, psychology, and sociology. Professor Richard Ruggles (1971), Yale University, Department of Economics, presented a paper at the symposium. What he has to say appears rather significant because he was one of the individuals who worked upon the basic constructs going into the derivation of the GNP.

He indicated that the national counts from which the GNP is derived are based upon transactions within the system during a period of time. These are transactions within the market place to which some type of economic value can be attached. He indicated that the GNP is largely the basis upon which budgetary considerations are derived.

Ruggles indicated that changes in taste and quality were not accounted for in the national accounts. He also indicated that the value of a product was not equivalent to its utility. In addition, he questioned the basic assumption which some now make that expenditures are equivalent to the quality of life. He indicated that value changes are not taken into account in the GNP and that the major assumption now being made by some that greater expenditures lead to greater quality of life is fallacious.

Professor Ruggles pointed out that the GNP is an output index and that it was not intended to be an index to measure satisfaction or significantly reflect the welfare of the nation.

Thomas Juster (1971) from the National Bureau for Economics Research presented examples of when the GNP could rise yet not adequately reflect a rise in the quality of life. One example presented was the doubling of the police and fire force to handle increased threats against personal security. For the GNP, this would be tallied as increased output while the result one is attempting to obtain is a maintenance of personal security. Hence, in this situation the GNP has risen but personal security has remained stable or declined. Juster also pointed out that the same kind of analogy applies to national security expenditures. National security expenditures may rise, but the security of the nation in reality may be dwindling. Another difficulty with the GNP, pointed out by Juster, is that school is not considered an investment oriented toward the future. Schooling appears nowhere in the GNP as having any benefit. Leisure also has benefits but these are not tallied in the general accounts.

Juster states that "in general if there is no market transaction involved, it is not in the accounts". An excellent example is volunteers whose services are not in the accounts. Services performed by housewives such as the preparation of meals and child care are also not in the accounts. Another factor not taken into consideration is time allocation, indicating what is the optimum allocation of time for the maximum health and happiness of the individual.

Professor William Nordhouse (1971) from Yale University, indicated that while the GNP does not take into consideration some of the above factors, it is a good indicator of short run economic stability.

John Kenneth Galbraith (Fusfeld, 1972) extends his criticism

of economic policy further indicating that the domination by private decisions about the consumption and production tends to starve the public sector. He says this is especially true when motivations center on individual gains, income, and wealth. Private spending on luxuries and entertainment expands, while such foundations of the future as education and basic science are slighted. Furthermore, modern marketing and advertising techniques are used by business firms to mold consumer spending to their needs as producers instead of adjusting production to match a pattern of consumer wants.

E.J. Mishan (Fusfeld, 1972) went even further in his argument stating that a materialistic society interested primarily in piling up more and more material goods was destructive of human values and pursued goals antithetical to human happiness. It could be that the views of Galbraith and Mishan are echoed by the new generation of youth disenchanted with materialism of mid-income America. The views may also be reflected by workers disenchanted with the monotony of their jobs and the limited horizons of their lives. This may be characteristic of Blacks and Latins condemned to low wages, poverty, and welfare.

Investigators have recently made preliminary attempts toward the development of a group of measures which would be included in a quality of life index. Marcel Olson (1969) at the University of Maryland, Department of Economics, issued a paper entitled, "Towards a Social Report". Olson suggests that measures of welfare within the general population or for the nation should include such things as disease, crime, health statistics, etc. Dr. Margaret Meade (1972) has suggested that nutrition is one of the basic and most ideal measures that can be utilized worldwide.

Professor Foa (1971) published an article in which he suggested that there might be six classifications which could account for most of the qualities of life. He named the six major classes as love, status, information,

money, goods, and services. He then showed how other considerations such as time would relate to the various six categories.

Another worker in the field who has presented some information at the American Association for the Advancement of Science Meeting is Dr. Jerry Coombs. He is the Chief of the Behavioral Science Section of the Center for Population Research at Bethesda, Maryland. Coombs enumerated a list of essential elements, in this case ten, which he felt should be included in a profile or an index of the quality of life. They are as follows:

1. Food, clothing and shelter
2. Health
3. Social Roles
4. Security
5. Training and education
6. Time, freedom, and resources
7. Sensory pleasure
8. Love
9. Goods and services
10. Physical environment

Coombs' and Foa's lists differ; however, from their respective lists, it can be seen that the measurements needed for the various elements included are not necessarily involved in the national accounts which provide the basis for calculation of the GNP. For example, in Dr. Foa's six classes - love, status, and information are probably in no way included in the general accounts. However, money and goods would be included and perhaps most services. For Coombs' list, security, sensory pleasure, love, time and freedom for leisure, and social roles would probably not be included in the calculation.

Pointed out by a number of individuals and perhaps appropriate at this time is the fact that while the GNP has risen over the last several years, along with this rise have been other indicators which would possibly say that the quality of life has not risen and may have plateaued or deteriorated . The first indicator is the rise in crime that has accompanied the rise in GNP. Certainly crime threatens one's personal security and when such is threatened

the quality of life is at stake. The same might be said for delinquency, divorce rates, etc. Perhaps one of the most stirring pieces of evidence concerning the quality of life has been information uncovered by the National Opinion Survey conducted by the Commission for Opinion Research Corporation. The survey was completed in 1971 and consisted of an opinion questionnaire asking where the person would like to live. Four categories were used:

1. Open country
2. Small town or city
3. Medium sized city or suburb
4. Large city or suburb

Responses indicated that 34 percent of those interviewed would like to live in open country, 30 percent in small towns or cities or suburbs, and only 14 percent in large cities or suburbs. (Table 3)

TABLE 3

Location of Residence and Preferred Location

	Where do you live now? (Percent)	Where would you prefer to live? (Percent)
Open Country	12	34
Small Town or City	33	30
Medium Sized City or Suburb	28	22
Larger City or Suburb	27	14
Total	100	100

SOURCE: National Public Opinion Survey conducted for the Commission by the Opinion Research Corporation, 1971.

This is in direct contrast with information provided through the 1970 census which indicates that 71 percent of our population lives in metropolitan areas, and it is expected that 85 percent of our population will

live in metropolitan areas by the year 2000. Note that present opinion indicated that only 14 percent would like to live in large metropolitan areas.

The above considerations consist of some of the factors that are not measured by the GNP. It would appear as though the assumption that all is well with the average American citizen as long as the GNP is rising is fallacious and could lead to unwarranted conclusions. Another consideration of the GNP indicates that within its calculations there are no predictors of future needs or of future events. It does not take into consideration as did the MIT "limits of growth" study, the resource reserves available. Hence, it would appear as though GNP is a good short-arm indicator which one can use for economic stabilization; however, as an indicator of the quality of life it leaves much to be desired. In fact, it is probably misleading. When calculating the quality of life, both at the present time and in the future, one needs to combine procedures such as that used by the MIT study and other indicators which are somewhat more difficult to measure involving security, personal space, time allocation, nutrition, disease, recreation, crime, etc. An index of this type holds greater promise for providing an adequate guide by which to allocate resources. The procedure used now rarely takes into consideration more than last year's budget and whether it is politically sound to increase expenditures or shift them from one category to another.

Regulation of Population Size

Ecologists for some time have been concerned about the rapidly growing human population. The following paragraphs will review theories and research relating to population growth and control. Some terms are of interest to us prior to entering this discussion. They are as follows:

1. Stabilization - is an irregular but restricted fluctuation around the mean. It tends to represent a period of time when the population is showing no significant growth or decline.

2. Carrying Capacity - refers to the optimum number of individuals that can be supported by the environment for an extended period of time. For most populations the carrying capacity and the stabilization size are equivalent.

3. Environmental Resistance - consists of factors or influences which resist population growth. Its influence ultimately causes population stabilization or decline.

4. Growth Potential - refers to the maximum possible input and retention within the population.

The growth of most populations follows the Sigmoid Curve presented in Figure 5.

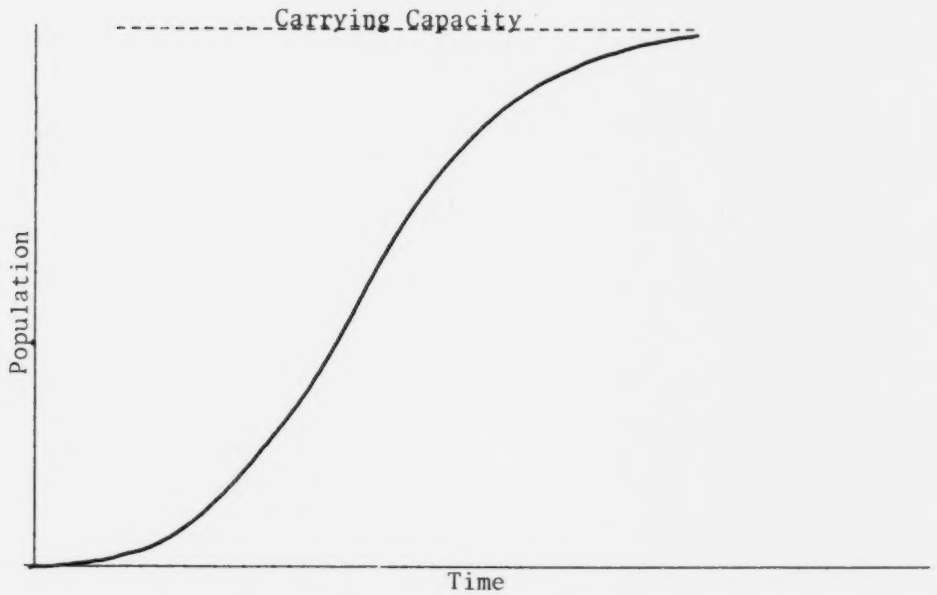


Figure 5: Sigmoid Growth Curve Population

During the early period of population growth, the growth potential is not restricted or extensively hindered. Hence, one has a rapid acceleration in growth. Somewhat later, environmental resistance begins to slow down the population growth rate until it reaches carrying capacity. At this time, theoretically, the population has stabilized. Other setting operations, however, may produce different types of growth patterns; i.e., when nutrients or other requirements accelerate prior to population growth an overshoot may occur. Animal ecology has demonstrated that overshooting the carrying capacity results in a population crash.

The MIT study and other ecologists are now basically concerned with defining the environmental carrying capacity for the human population. The MIT study would indicate that we have basically overshot the carrying capacity and that around the year 2100 a population decline or crash is likely to occur . Other ecologists are presently arguing that perhaps we have not overshot carrying capacity, but that we are approaching it and should begin pursuing activities which would result in population stabilization. It should be noted here that the environment supporting the human population involves many technological and complex activities. The breaking down of only one of the essential technological elements or links within the chain supporting the human population would be all that is necessary to cause the population to begin declining. Technological failures such as the depletion of power reserves or resources could have this effect.

During the last couple of decades, those in scientific circles have investigated population growth and its social consequences. One of the foremost investigators of population density and its social consequences is John B. Calhoun (1962). In order to investigate the problems wrought by

high density population, Calhoun utilized animals as his research subjects. His findings indicated that during the early part of the growth period, animals behaved in a normal fashion, i.e., territories were established, nests were built, and young were raised. However, as the population increased and became more dense, unusual or pathological behaviors began to appear within the population. The dominant, aggressive animals within the population exhibited signs of pathology such as attacking females and juveniles, showing a tendency for biting other animals, and inflicting severe wounds. Other individuals within the densely populated community became like somnambulists. They appeared to ignore all other members of the community and their social disorientation was nearly completed. During the early part of the population growth, females normally built nests that were well-shaped and offered ample warmth and protection for the young; however, as the population density increased, the effect upon the nest building and rearing of young was profound. It was obvious from Calhoun's study that as the population density increased, the normal behavior repertoire begins to break down under new and unusual intense pressures. High population density can have a number of different effects upon social organization. A well-known example is that high population density results in social disorganization to the extent that lemmings run into the sea, hence causing their own death.

The impact of population density upon social behaviors in men has been reviewed by George M. Carstairs (1971). Recent surveys, both in the East and in the West, have shown that already the rates of almost every form of mental illness are higher among the socio-economic underprivileged sections of contemporary society. The primary question we are confronted with is a rather vital question. What will be the consequences for the social

well-being of an individual in a population of ever-increasing density? As of yet the science of human behavior is not sufficiently developed to answer the question with precision; however, some studies have recently appeared in the literature. Reports of high population density and its effect upon human beings have come from survivors of concentration camps - among whom are the outstanding psychologists, Bettelheim (1963) of Chicago, and the psychiatrist Eitinger (1961) of Norway. Their candid reports of what it is like to be in a concentration camp with an extreme probability of not coming out alive make rather bitter reading. They show how even the most upright and courageous people tend to show a deterioration in their usual humanitarian values. Others have described life in the slightly less rigorous but still very confined and crowded prisoner of war camps. Two biologists who have shown a special interest in this field are Paul Leyhausen (1965) and Conrad Lorenz. Both endured several years of internment in prisoner of war camps. Lorenz writes about his own experience in a Canadian prisoner of war camp. He tells very candidly how after long confinement, he found the slightest mannerism of his companions in the officer's hut to be un-endurably irritating. Several years ago, Faris and Dunham (1939) drew attention to the ecological concentration of certain forms of mental illness in those parts of a city where both overcrowding and social disorganization were evident. Subsequent researchers challenged their specific contention that schizophrenia is generated by conditions of life in the socially-disorganized community. But many other studies have confirmed their demonstration that alcoholism, illegitimacy, divorce, delinquency, and numerous other forms of social pathology are more prevalent in areas of high population concentration. It is also interesting to note that studies

of attempted suicide have shown the most important social correlate is overcrowding. (Kessel and McCulloch, 1966). Typically, a person who makes a non-fatal suicide gesture has been harrassed beyond endurance by the recurrent friction within a domestic group in cramped and over-crowded premises.

A similar phenomena has occurred repeatedly in modern times when the pace of political change has outstripped society's capacity to meet the newly-aroused expectations of its members. Hence while population increases, the standard of living actually declines at the very time when people's aspirations have risen. This sets the stage for outbreaks of collective irrationality and violence. In short, the quality of life has deteriorated while the Gross National Product has increased. The dissonance created by this type of disparity results in dissatisfaction which becomes behaviorly expressed.

Population control consists of two basic methods. The first method consisting of the density independent hypothesis asserts that the population is regulated by a set of negative natural controls. Under this hypothesis, it is assumed that the population will produce young as fast and as proficiently as they can. The main factors keeping the population density down includes starvation, accident, parasites, diseases, and predators.

The density dependent hypothesis indicates that within the environment there is a certain feedback mechanism utilized by the population to control the number of young brought into the population. Hence if the search for food indicates that little is available, individuals within the population will produce fewer young. Thus, in a sense, reproduction is adjusted to the environment's carrying capacity. With relation to man, he has no predators to limit his population. He has overcome most diseases

through either preventive or intervention methods and he has overcome starvation by modern technology. There appears to be a few external factors which can effectively keep the human population within limits. The control of population density remains the responsibility of the population itself. Hence internal control mechanisms must exist or be devised. If not, the population will crash after exceeding the carrying capacity because it has for a period of time "borrowed" from resources that would have been utilized by future generations.

Intrinsic control of the population can be achieved through several mechanisms. Three of the most readily recognized forms include:

1. Limiting the input to the population.
2. Increasing age at which the female bears her first child thus slowing down the growth rate.
3. Increasing output from the population by artificially inducing death.

Because of our society's present mores, Number 3 appears to be an unlikely solution for the control of population density. In fact, work is now underway which will potentially increase the life span of the individual by fifty years. Hence, alternative Number 3 is not likely to be utilized. Alternative Number 2 does not have the effect of stabilizing population, but simply slowing down growth rate. Through this mechanism, overpopulation would ultimately also be reached. Alternative Number 1, the limiting of the input to the population, seems to be the most acceptable method at this point in time. Havermann (1967) wrote a book entitled BIRTH CONTROL. The book itself reviews nine common methods of contraception presently being utilized. They are as follows:

1. Rhythm Method
2. Diaphragm
3. Condom
4. Withdrawal (Coitus Interruptus)
5. Chemical Barriers
6. The Douche
7. Interuterine Devices
8. Sterilization
9. The Pill

Of greater interest are the methods which are projected to be available within the future. Among the potential methods in the future is what is now referred to as the "20-year pill". The pill is not taken by mouth, but rather implanted under the skin in the form of a capsule. Each day a very small amount of the chemical seeps through the wall of the capsule and enters the blood stream, just enough to provide the same amount as would a pill taken orally. The daily doses are so small that the capsule might contain enough chemical to last approximately 20 years. At any time that a woman decided whe wanted a child the capsule could be easily removed by her doctor.

The second alternative mentioned is vaccination. Evidences appear that the body may be made immune to sperm just as it can be made immune to smallpox virus. This idea has been verified by recent studies carried out among prostitutes. Because of their over-exposure to sperm, they have developed antibodies which actually attack and reject sperm, making pregnancy impossible. Theoretically, it should be possible to develop a vaccine made of sperm or sperm-like substances from animals that would cause the production of antibodies in sufficient numbers to prevent pregnancy for a long time.

The third method presently being reviewed and worked upon is the "morning after" pill. "Morning after pills" are made in various forms of estrogen and have already been tested by using animals. Administered after intercourse, they have prevented pregnancy in both rats and monkeys.

The last method is pills for men. Not all research on future methods has been confined to pills and injections for women. Some kinds of pills for men which make conception impossible by preventing the development

of sperm or making the sperm incapable of uniting with the egg appear to be possible. Several substances have already been found to make men sterile by preventing the development of active sperm. None, however to this point have been satisfactory.

The Institute of Future Research (Gordon and Ament, 1969) using the recently devised Delphi and crossmatching procedure, obtained projections from the most renowned workers in the field of birth control concerning the possible date when cheap and effective mass sterilization techniques or birth control techniques might be available. The researchers concluded that the development of economical mass-administered contraceptive agents would occur somewhere around 1976. Estimates ranged from about 1973 through about 1980. The consequences of such technological breakthrough were discussed by members involved in the research and four major consequences were anticipated. They are as follows:

1. That there be significant relaxation of population pressure where the substance was used.
2. Major changes in social values associated with child bearing and child rearing and sexual mores would occur.
3. That societal objections relating to preservation of individual choice, religious implications, and fear of genocide would become involved.
4. The birth of children would become a privilege rather than a right.

Several other consequences which fall under the four major ones just reviewed were also mentioned. They included the possible reaching of international treaties through the United Nations concerning the establishment of family size limits. Another consequence concerns the establishment of financial incentives and the initiation of tax reforms which would reward small families. In addition to this there may be establishment of financial reward systems which maintain a desired sex

ratio. This depends upon technological breakthroughs to control the sex of infants. It was felt by some members of the research group that the passage of Federal legislation to regulate sex ratio and family size was also a possibility. They also felt that established new approaches to foreign policy would probably include aid to underdeveloped nations concentrating upon their acceptance of birth control measures. Although the technological breakthroughs may be made and available sometime during the late 1970's, they felt that new research might pursue effective mass contraceptive means perhaps in the form of aerosols or additives to staples or soft drinks.

Another impact which they felt might be present would be the wide-spread dissemination of birth control information nationally and internationally on both a social and a personal level.

Samuel M. Wishik (1969) has suggested that public knowledge attitudes, and practices are essential elements in the practice of population control. He has indicated that data used to monitor progress should include the elements listed below and their subcategories:

Knowledge about:

1. Reproductive physiology
2. Contraceptive methods
   Techniques for the use - advantages and disadvantages - contraceptive indications - side effects - effectiveness

Attitudes toward:

1. Contraception and different methods
2. Family size
3. Parenthood
4. Aspiration for social improvement and academic achievement
5. Abortion

Practices:

1. Types of contraception
2. Duration and continuity
3. Abortion

Dissemination of this type of information and that concerning population growth, the quality of life, and the availability of non-renewable resources are the types of information which will alter both public knowledge, attitudes, and practices. Thus hopefully preserving the quality of life or enhancing it.

Population Quality

From the preceding reviews, it is obvious that continuing pressure will be exerted to control population. As a result, the number of children per family will decline until it stabilizes at replacement or less. This approach to the future appears to be necessary, based both on the issue of the quality of life and the availability of non-renewable resources. Another factor at the present time which is tending to produce a deceleration in the average number of children per family is cost. Ritchie H. Reed and Susan McIntosh prepared a paper entitled The Cost of Children in 1972 for the President's Commission on Population Growth and the American Future (Rockefeller, 1972). Below in Table 4, one can observe that the total discounted cost for the first child born into a family is approximately $60,000 by the time he leaves the family and is on his own. It appears as though the economic factor (cost of raising a child) will exert its influence upon

couples and have an additional decelerating effect upon the growth of our population.

TABLE 4

The Total Cost of a Child, 1969

	Discounted	Undiscounted[a]
Cost of giving birth	$ 1,534	$ 1,534
Cost of raising a child	17,576	32,830
Cost of college education	1,244	5,560
Total direct cost	20,354	39,924
Opportunity costs for the average woman[b]	39,273	58,437
Total costs of a first child	$59,627	$98,361

[a]Discounted and undiscounted costs spending $1,00 today costs more than spending $1,000 over a 10-year period because of the nine years of potential interest on the latter. This fact is allowed for in the discounted figures by assuming interest earned annually on money not spent in the first year. True costs are not accurately reflected in the undiscounted estimates, for thes are simply accumulations of total outlays without regard to the year in which they must be made.

[b]Depending on the educational background of the mother, the opportunity costs (earnings foregone by not working) could be higher or lower.

The President's Commission on Population Growth reported that many couples have only a vague idea of the financial cost of a child and that more and more parents are enlarging the expectations of their children. Usually the change in expectations means an additional rise in cost. Parents today, in addition to paying for the birth and rearing of a child, may also bear the cost of college education and perhaps some of the costs incurred by the

child during his early entry into the working world. Hence the committment to the child no longer extends to 18 years, but extends to the mid-20's thus spiraling costs for parents.

It appears as though the spiraling cost of raising children, depletion of non-renewable natural resources, and the quality of life issue will have a substantial impact upon the number of children born in the United States. These factors backed up by the technological capabilities and know-how surrounding birth control will provide for a new era in which the potential child and his needs are thought out and planned for in advance. Hence, within the next few generations we will be entering an era of the "quality child". The quality child is one who is defined as having been planned, and most of the time he will be provided with an optimal environment for development. Such has not necessarily been the case in the past. According to estimates developed in the 1970 national fertility study conducted by the Office of Population Research at Princeton University, 44 percent of all births to currently married women during the five years between 1966 and 1970 were unplanned and 15 percent reported by the parents as having been unwanted. Only one percent of the first births were never wanted, but nearly two-thirds of the sixth or higher births were so reported. In theory, this incidence of unwanted births implies that 2.5 million births occur in that five-year period which would never have occurred had the availability of perfect fertility control methods permitted couples to realize their preference. The Princeton group stressed that these estimates are conservative. Table Number 5 reports unwanted fertility in the United States (Rockefeller, 1972). It indicates the influences of race and education upon unplanned and unwanted births. The Princeton group found that for Caucasions having an eighth grade education or less, the

probability of bearing unwanted children is 25 percent and that 53 percent of the children are unplanned. In contrast to this, if you are Caucasian and have a college education or more, 7 percent of the births to your group will be unwanted and only 32 percent unplanned. It should be noted here that not all unwanted births become unwanted children. Perhaps most are accepted and loved, but many are not and the cost of them to their siblings, parents, and society at large is considerable though not easily measured. The cost of unwanted children to society will be examined in later chapters.

TABLE 5

Unwanted Fertility in the United States, 1970[a]

Race and Education	Most likely Number of births per Woman	Percent of Births 1966-70 Unwanted	Percent of Births 1966-7- Unplanned[b]	Theoretical Births per Woman without Unwanted Births
All Women	3.0	15	44	2.7
College 4+	2.5	7	32	2.4
College 1-3	2.8	11	39	2.6
High School 4	2.8	14	44	2.6
High School 1-3	3.4	20	48	2.9
Less	3.9	31	56	3.0
White Women	2.9	13	42	2.6
College 4+	2.5	7	32	2.4
College 1-3	2.8	10	39	2.6
High School 4	2.8	13	42	2.6
High School 1-3	3.2	18	44	2.8
Less	3.5	25	53	2.9
Black Women	3.7	27	61	2.9
College 4+	2.3	3	21	2.2
College 1-3	2.6	21	46	2.3
High School 4	3.3	19	62	2.8
High School 1-3	4.2	31	66	3.2
Less	5.2	55	68	3.1

[a]Based on data from the 1970 National Fertility Study for currently married women under 45 years of age.

[b]Unplanned births include unwanted births.

Information is now beginning to emerge concerning factors which help promote the optimal environment for the conception and prenatal development of children. Information necessary to determine optimal environmental conditions has been derived by a number of studies. The results of these studies have then been compiled and factors relating the attainment of an optimal outcome can be listed. The factors have been used to develop high-risk indexes or high-risk registers. The registers were developed originally to identify high-risk pregnancies, However, they also indicate under what optimal conditions a child has his greatest probability of emerging from the prenatal process in healthy developmental condition. High-risk assessment has been used in the Canadian Public Health System (Perinatal Problems, 1971) and also experimentally at the Denver Hospital (Downs, 1970). Below is a listing of the high-risk pregnancy factors. This index which is used in the Ontario system includes factors such as maternal age, race, marital status, parity, past obstetric history, medical-obstetric disorders and nutrition, generative tract disorders, smoking, and socio-economic status. These factors play an important part in determining the optimum environmental conditions under which a child can be brought into the world.

I. Maternal Age

Under 15	20
15-19	10
20-29	0
30-34	5
35-39	10
Over 40	20

II. Race and Marital Status

White	0
Nonwhite	5
Single	5
Married	0

III. Parity

0	10
1-3	0
4-7	5
Over 8	10

IV. Past Obstetric History

Abortions		Prematures		Foetal Death		Neonatal Death		Congenital Anomaly		Damaged Infants	
1	5	1	10	1	10	1	10	1	10	Physical	10
2	15	2+	20	2+	30	2+	30	2+	20	Neuro-logical	20
3+	30										

V. Medical-obstetric Disorders and Nutrition

Systematic illnesses	
Acute, mild	5
Acute, serious	15
Chronic, non-debilitating	5
Chronic, Debilitating	20
Specific infections	
Urinary:	
acute	5
chronic	25
Syphilis:	
treated	0
untreated	20
untreated at term	30
Diabetes	
Pre	20
Overt	30
Heart Disease	
Class I or II	10
Class III or IV	30
History prior failure	30
Chronic Hypertension	
Mild	15
Severe	30
Nephritis	30

Anemia	
Hgb, 10-11 Gm.	5
Hgb, 9-10 Gm.	10
Hgb, less than 9 Gm.	20
Endocrine Disorders	
Definite adrenal, pituitary or thyroid problem	30
Recurrent menstrual dysfunction	10
Involuntary sterility:	
Less than 2 years	10
More than 2 years	20
Rh Problem	
Sensitized	30
Prior infant affected	30
Prior ABO incompatibility	20
Nutrition	
Malnourished	20
Very obese	30
Inadequate diet but not malnourished	10

VI. Generative trace disorders

Prior foetal malpresentations	10
Prior caesarean section	30
Known anomaly or incompetent cervix	20
Myomas:	
Over 5 cm.	20
Submucous	30
Contracted pelvis:	
Borderline	10
Any contracted plane	30
Ovarian Masses:	
Over 6 cm.	20
Endometriosis	5

VII. Smoking

Non-smokers	0
Less than pkg. a day	5
More than pkg. a day	10

VIII. Social and economic survey

Employment - husband, patient; annual income adequacy, public assistance;

education - husband, patient.
housing - location, quality, facilities, and neighborhood environment.

While this information is extremely important, it is not generally available to young or prospective parents. Canadian systems have found, by using this high-risk pregnancy assessment, that ten percent of the live births occurring within their Provinces are products of high-risk pregnancies. This risk is both to the mother and/or child.

Other methods of assessing risks to the developing organism have been devised. Fort (1972) uses several variables in determining high-risk pregnancy and indicates that these variables are related to the development of learning disabilities or mental retardation. He uses the following variables:

1. Too young or too old
2. Having children too often
3. Having too many children

Fort (1972) indicates that we need to pursue a policy of "genosave". It would entail educating potential mothers concerning the optimum time and manner in which they should bear children. A second generation now beginning to emerge on the scene, concerning having children and a consideration which is mandatory to determine that they have optimal basis upon which to develop, is genetic counseling and its related ally of genetic engineering. Fuhrmann and Vogel (1969) brought forth a book which emphasized that "an ounce of prevention is worth a pound of cure". They indicated that the medical truth of this statement is so self-evident that it is simply taken for granted, yet they feel that it has become mere lip service for many physicians and clients.

They indicated that many doctors are as of yet unaware that the appearance of serious, sometimes fatal diseases can be avoided by preventing the conception of sick human beings. Our knowledge of genetics

permits relatively accurate prediction based on statistical probabilities of the occurrence of defects and diseases within families.

They (Fuhrmann and Vogel) estimated that approximately five percent of the population could benefit from genetic counseling. Harry T. Lynch (1969) has edited a book entitled DYNAMIC GENETIC COUNSELING FOR CLINICIANS. He indicates that a greater proportion of the population could perhaps utilize genetic counseling and that it may be up to 20 percent. Lynch reviews the various ailments which are now known to be associated with genetic inheritance. They include the following:

-Psycho Genetic disorders
-Cardiovascular diseases
-Mental retardation and mental disorders
-Neurological disorders
-Gastroenterology problems
-Heredity traits and cancer, etc.

Under neurological impairments, he reviews such things as muscular dystrophy, Wilson's disease, Huntington's Chorea, Myotonia Dystrophica. Under the general rubric of mental retardation and mental disorders, he discusses malnutrition and retardation; bio-chemical defects and retardation; carbohydrate abnormalities; lipid abnormalities; amino-acid and protein abnormalities and hormone and hormone-type metabolical disorders. Under the general rubric of mental disorders, he discusses schizophrenia; manic-depressive psychosis; involutional and senile psychosis; and psycho-sexual deviations and criminality. He uses supportive evidence such as the twin studies. The potential benefits from genetic counseling are essentially those of prevention. The field, itself, attempts to provide the prospective parents with information concerning the probability of their offsprings inheriting certain types of disorders characteristically found within the family.

Allied with the field of genetic counseling is another field which is sometimes referred to as genetic engineering or genetic management. In the past year or two, quite a bit has been seen in the popular press about human genetic engineering and the new biology. Some of the articles have been partly "tongue in cheek," others sober and full of chilling predictions for the future. The effect of such journalism has probably left both the public and scientists outside the immediate realm of publicized biological feats confused, if not alarmed. The best way to get an understanding of genetic engineering and whether it will soon become a reality is to talk to some of the specialists or review some of their publications. One of the most renowned is Dr. James Danielli, a biologist who worked at the State University of New York, Buffalo. Danielli received worldwide publicity, with both praise and concern, when he announced in December of 1970 the first synthesis of a living cell. Danielli comments (Arehart, 1971) concerning genetic engineering indicate the crucial point is an understanding of the genome. His comments indicate that when they arrive at an understanding of the genome then they can hope to safely repair defective parts. According to Danielli such a breakthrough may be 20 years away or more. He estimates the time span to be 20 to 50 years before human chromosomes with defective genes might be replaced. Yet he is confident that human genetic engineering is coming. The process by which corrections might be made has been discussed by Kopac at New York University. The procedure itself, according to Kopac (Arehart, 1971), will ultimately amount to micro-surgery. He discussed several problems with the procedure and its present state of development.

Kopac has been working with micro-surgery to manipulate chromosomes changing the sex of the fetus. He admits that their success so far has not been howling. An additional problem pointed out is that only some 100 human genes have been identified for what they do. A handful of them have been located on the chromosomes, and a select few of these genes have actually had their precise geographic location on the chromosome map. Yet most of the other chromosomes remain to be mapped and their particular influence has not been determined. Probability would indicate that within the next two to five decades, genetic engineering or management will become a reality. The consequences of this breakthrough have been reviewed by the Institute for Future Research (Gordon and Ament, 1969). They found the following potential consequences:

- -Greater differentiation between socio-economic classes and between the developed and the less-developed nations, depending upon who could afford it.
- -Specialized classes such as supermen, governors, etc., could evolve because of these potential consequences.
- -Suggested means of intervention was also contemplated.

If genetic engineering becomes a reality they suggested:

- -The initiation of a genetic counseling and genetic manipulation service free to everyone.
- -The establishment of arbitration boards to make molecular engineering decisions.
- -Maintaining family based child rearing units and family control of the development to insure the reproduction of the present social mix.

While genetic engineering or management is at the present time a consideration only for the future, it is evident tnat such a breakthrough would produce considerations and ethical problems not yet encountered in our society. Such issues have been brough forward by John V. Tunney, (1972) the Junior Senator from California and

Melden E. Levine, a lawyer and legislative assistant. Tunney ultimately concludes his discussion indicating that all segments of society should be involved in the debate concerning the new technology; and he says that the technologies must be discussed and debated among lawyers, doctors, theologians, legislators, scientists, journalists, and all other segments of society. He indicates that the issues raised require interdisciplinarian attention and that we cannot begin to consider them too soon.

SUMMARY

Population Growth and Related Factors

The World, the United States, and Idaho populations are growing at an ever-increasing rate. Population projections for the State of Idaho indicate that by the year 2000, our population will have reached one million and by the year 2070, the population will be about two and three-quarter million. These calculations were developed by the Idaho Water Resource Board and didn't take into consideration the net gain in population which the State began to experience in 1969. Additional potential influences such as prolonging the life span by controling the aging process were also not considered in the calculations.

The picture is further complicated by the fact that our reproductive rate is four-tenths children per family higher than the national average. These facts seem to lead to the conclusion that Idaho will experience a more rapid growth rate than the nation over the next several generations.

Population growth in a materialistic society leads to a more extensive resource utilization. Non-renewable resources such as metals and fossil fuels can be over-utilized, hence, "borrowing" from the future generations will result in population decline or crash in the future. Ecologists at the present time agree that unlimited growth cannot go on and that changes in man's use of materials are needed. The primary point of contention is centered around the carrying capacity for the human population. The Club of Rome study indicated that we have

already exceeded carrying capacity while other ecologists indicate that we may still be approaching the point where stabilization is needed.

For a number of years the GNP has been confused with, and misused as a general indicator of the quality of life. Richard Ruggles (1971) one of the founding fathers of the GNP has now criticized it as a inadequate measure of the quality of life and has emphasized that it represents only economic transactions in the market place. Foa (1971) and Coombs (1971) have presented major constructs which they feel must be included in an index which reflects the quality of life. Notably at least 50 percent of the constructs are in no way reflected by the present calculations going into the national accounts. The following are considerations not taken up in the national accounts but necessary for an index of the quality of life:

-Personal space
-Time and freedom
-Sensory pleasure
-Love
-Social roles - status
-Training and education
-Information

Developing an index of the quality of life at the State level holds great promise for providing an adequate guide by which to allocate resources. The procedure used now rarely takes into consideration more than last year's budget and whether it is politically sound to increase expenditures or shift them from one category to another. If properly developed, the index could prove to be an adequate management tool and provide information concerning trends over time. Trend information is

vital and necessary to prevent unwanted allocation of resources, to promote or intervene before a crisis has developed.

Regulation of Population Size

Because of population growth, resource utilization, and issues involving the quality of life, regulation of population size will become necessary. It is necessitated because we have overcome extrinsic control mechanisms such as disease, famine, etc. We must build into our population intrinsical controls such as limiting the input to the population.

Birth control constitutes the most effective method of intrinsic limitation that we presently have available. While present methods are not totally effective, technological breakthrough is eminent and will provide cheap effective mass contraceptive substances whereby near-perfect control could be obtained.

The consequences of mass utilization could include the following:

- That there be significant relaxation of population pressure where the substance was used.
- Major changes in social values associated with child bearing and child rearing and sexual mores would occur.
- That societal objections relating to preservation of individual choice, religious implications, and fear of genocide would become involved.
- The birth of children would become a privilege rather than a right.

Dissemination of this type of information along with information concerning population growth, the quality of life and the availability of nonrenewable, depletable resources are the types of information which will alter both public knowledge, attitudes, and

practices, hopefully preserving the quality of life or enhancing it.

Population Quality

From the proceeding information, it is obvious that continued pressure will be exerted to control population resulting in a decline in the number of children per family. This is especially true due to the ever-increasing financial burden of child rearing and the potential control enabling families to realize their preferred number of children instead of fostering unplanned and unwanted children.

The above information paired with information concerning the optimal environment for conception and prenatal/postnatal development will hopefully result in our entering into an era of the "quality child" - a child who is planned and for whom adequate financial, life style, etc., arrangements have been made.

In order to attain this goal, extensive public education and appropriate social support systems will be needed.

PRENATAL CONSIDERATION

Introduction

The major philosophical consideration inherent throughout is as follows: It is paramount to insure that all environmental factors which promote growth and development of a child are optimized so that he may reach his maximum potential.

With this philosophy in mind, the present chapter will attempt to review major factors relating to the optimal development of children during the prenatal period. In order to determine what the optimal environment might be, one must review outcomes of environments that have been less than optimal.

In the book, Lengthening Shadows, contributing members of the American Academy of Pediatrics identified several important prenatal factors which could result in chronic disabilities. The important factors include inadequate prenatal supervision of the pregnant woman, malnutrition, placental abnormalities, intrauterine infections, and maternal disease.

Prenatal Supervision and Care

If a physician is to effectively care for the mother and child during the prenatal period, the mother must be seen early in pregnancy or before conception and keep regular appointments throughout the pregnancy. In order to assess the status of early care in the State of Idaho, a Prenatal, Perinatal, and Postnatal Survey was initiated by the Idaho Office of

Child Development. Two medical students interviewed 25 percent of the general practitioners and 50 percent of the obstetricians and pediatricians in the State. The interviews were structured to provide information concerning the type of care given and consumer utilization of the services.

In the statewide survey, most physicians indicated that the majority of their patients are seen for the first time during the first trimester of pregnancy. However there are a few communities where mothers are seldom seen, if at all, during the first three months of pregnancy. This makes effective delivery of health care impossible. Certain viral infections, especially during the first trimester, can result in a severely crippled child. The resultant child may cause considerable hardship to his family and ultimately cost the State several hundred thousand dollars. Table 5 gives specific information concerning consumer utilization of prenatal care vended by physicians throughout the State. As can be observed, the following community's physicians indicated low levels (60 percent or less) of preventative health care utilization early in the gestation period: Wendell, Jerome, Burley, St. Maries, Caldwell, Sandpoint, and McCall. Due to the nature of the sample not all physicians were contacted in the aforementioned communities. Thus, the figure may be representative of only a portion of the community's population.

Prenatal health care services in Idaho seems to be relatively uniform. The initial prenatal visit usually includes a complete history and physical examination, including pelvic examination and evaluation as to adequacy. Laboratory studies include hemoglobin, hema-

TABLE 5

PERCENT OF CONSUMERS INITIALLY RECEIVING SERVICE DURING THE THREE TRIMESTERS BY COMMUNITY

COMMUNITY	1st	2nd	3rd	TOTAL CASELOAD
Twin Falls	78%	16%	6%	213
Idaho Falls	72	22	7	111
Rexburg	90	5	5	
Rigby	100			10
Blackfoot	77	15	8	262
Salmon	90	10		11
Wendell	60	30	10	35
Jerome	59	27	14	155
Buhl	75			27
Burley	56	32	12	115
Hailey	75	20	5	40
Coeur d'Alene	84	15	1	105
Nampa	73	17	10	255
Mountain Home	80	15	5	53
St. Maries	10	75	15	50
Caldwell	60	34	6	125
Wallace	70	20	10	70
Moscow	75	25		175
Kellogg	81			147
Sandpoint	59	39	2	44
McCall	20	75	5	30
Lewiston	86	8	8	517
Pocatello	76	15	9	1125
Boise	79	16	5	555

tocrit, urinanalysis, serology, RH type, CBC, blood sugar (if indicated), rubella, or atypical antibodies titer. The Tine test for TB was also considered part of the first visit routine. Rubella immunization before pregnancy was recommended by several physicians. A pap smear and GC cultures were not routinely taken by some physicians, although the latter was taken more frequently on teenagers. Several physicians also obtained a chest x-ray routinely. Dental care was usually recommended sometime during the first or second trimester.

Follow-up exams usually included checking weight gain, blood pressure, edema, urinanalysis, uterine growth, and fetal position. The frequency of visits was generally once per month during the first and second trimester, increasing of course with any indication of impending toxemia. With routine checkups, instructions for pre- and postpartum care were reinforced. Delivery instructions and child care instructions were usually made available during this time. Exercise instructions were also given.

During the third trimester, the frequency of visits usually increased to perhaps every two weeks during the seventh and eighth month, and weekly visits during the last month. During the third trimester, most physicians suggested a repeat antibody titer if the patient was RH negative and also aminocentesis, if indicated. X-ray pelvimetry on primiperas or others with suspected dephalopelvic disproportion was usually taken the last two weeks.

Two communities had practicing physicians who indicated that consumer utilization was above 60 percent during the first trimester but that 10 percent or more of the consumer population failed to utilize their services until the last trimester or deliver. The community physicians were practicing in Wallace and Nampa (Table 5).

Nutrition

In testimony before the subcommittee on children and youth of the Committee of Labor and Public Welfare in the 92nd Congress, Reginald S. Lourie, M.D., Professor of Pediatric Psychiatry at George Washington University School of Medicine and Director of Psychiatry at the Children's Hospital and Hillcrest Children's Center in Washington, stressed the increased importance with which the prenatal period is now being viewed. He indicated that by the time a baby is born it has well-developed patterns which will last the rest of his life. He gave the example of oxygen supply interruption, a situation in which the structure itself is threatened. How the fetus responds to stress at this time can become a prototype response for stress when it is later encountered.

Dr. Lourie indicated that the nutritional status of the mother has a great bearing upon the kind of child that will be born. In fact, he indicated that perhaps one of the single most basic determinants of what kind of fetus will result, is the nutritional state of the mother at the point of conception. In the late 1960's interest quickened and a period of re-appraising the impact of nutritional deprivation started. Attention is now being given not only to the immediate effects of nutritional deprivation on the outcome of pregnancy, but also to the long-term effect on the subsequent physical and mental development of the child. An appreciation of the complexity of these relationships and the application of improved techniques to the study of nutrition, both in populations and in the laboratory, is beginning to provide fuller answers concerning nutritional deprivation. While much of the research in the past has indicated that poverty appears to be central to the chain of circumstances surrounding poor nutrition, there are also women with adequate incomes who for other

reasons including the current fashion of slimness, arrive at child-bearing age with poor health, low nutritional status, and inappropriate health habits (National Academy of Sciences, 1970).

Some of the recent research has centered around prenatal protein deprivation and its consequences. Ellison, Samuelsohf, and Bresler (1970) found that laboratory animals deprived of protein during the prenatal period showed significant learning deficits. Later, research on their part using laboratory animals has indicated that such deficits are transferable to later generations and that they are not genetic per se. Hence, nutritional deprivation during the prenatal period may have an impact on subsequent generations. Their research indicated it could be detectable up to and including the third generation of offsprings.

The severity of diet restrictions used in animal studies has been greater than commonly encountered in human populations, although from time to time individual women may consume comparatively restricted diets. Because there are differences in fetal growth and development attributable to species characteristics themselves, animal studies relating to dietary changes must be interpreted with caution.

Evidence that good nutrition is important to the human reproductive efforts derivates mainly from studies of large populations. The experiments in Great Britain during World War II with pregnant women who were given special priority under the food rationing policy proved dramatic. During this period, the stillbirth rate fell from a previously rather stable figure of 38 per thousand live births to 28 per thousand. This was a decline of about 25 percent during a period when many aspects of the physical and social environment were not optimal.

Small-scale feeding experiments have been undertaken to assess the impact of diet during pregnancy on reproductive performance. They have proven difficult to interpret in terms of a single variable such as nutrition. Traditionally, birth weight has been used as an important index of the quality of fetal development. Whether retardation of physical growth in utero is followed by retardation of later growth and development remains open to question. Despite great interest, there has been little investigation of the mental development of children whose growth in utero was retarded. A study by T. Fujikara and L.A. Froehlich (1971) found that the mental and motor development in monozygotic co-twins with dissimilar birth weights showed no differences. Since the lighter of the monozygotic twins presumably suffered drastic nutritional setbacks in utero compared to its co-twin, their findings suggest that the human brain is fairly resistant to the effects of inter-uterine malnutrition.

During pregnancy, hemoglobin must be produced by the mother and by the fetus. In order to develop this complex molecule of protein and iron, there must be an ample supply of protein to furnish the essential amino acids. Iron, copper, zinc, folic acid, vitamin B12, and other vitamins that serve as co-factors in synthesis of heme and globin must be present. In order to complete this task it has been found that iron stores of pregnant women are seldom large enough to meet the iron requirements of pregnancy. It has also been found that the food intake each day of pregnant women rarely provides enough iron. Consequently, iron supplementation during pregnancy in the form of ferrous salts can be beneficial in building and protecting maternal iron stores. Iron deficiency anemia results from increased demands for iron in the face of inadequate stores.

As already mentioned, folic acid is associated with the development of hemoglobin. This fact has created some interest because poor women frequently demonstrate a folic acid deficiency. So far, attempts to reduce pregnancy wasteage by means of folic acid supplementation have been unrewarding (National Academy of Sciences, 1970). Nevertheless, supplementation with folic acid was recommended by the Committee on Maternal Nutrition.

The occurrence of pregnancy during adolescence presents both physical and psychological problems. Adolescent girls are at risk if pregnancy occurs before their own growth has been completed. The majority of girls attain physical maturity around 17 years of age, and pregnancy beyond this age has not been found to present specific biological hazards. The impact of pregnancy in adolescence may be assessed by reviewing statistical data concerning live births, birth weights, and mortality levels. In the United States live births to mothers 17 years of age and under have increased both in absolute number and as a percentage of all live births. Teen-age mothers have a disproportionate number of babies weighing less than 2500 grams at birth in contrast to the overall United States value of 8.3 percent for all births in this category. In 1965, the percentage of low birth weight babies for non-white mothers under 15 years of age was 21 percent and for white mothers of the same age it was 13 percent. Neonatal, postnatal, and infant mortality rates are much higher for infants born to young mothers. They are even greater for young girls with repeated pregnancies (National Academy of Sciences, 1970).

Biological reasons for this seem to center around the fact that prior to the age of 17, nutritional requirements reflect the special demands of growth and maturation. Evidence concerning the nutritional

status and food habits of adolescent girls suggest that dietary habits are often bizzare and that intakes of iron, calcium, vitamin A, and ascorbic acid tend to be particularly inadequate. It has been estimated that 10 to 12 percent of the adolescents entering pregnancy are obese, and that a somewhat smaller proportion are underweight. This pattern of dietary intake is reflected in the larger number of underweight and high-risk babies born to adolescent mothers. (National Academy of Sciences, 1970).

Another consideration is toxemia of pregnancy which seems to have some nutritional correlates. Caloric intake and the quantity of protein consumed have both been held by some physicians to influence the development of toxemia and to have some impact upon its prevention. The limitation of salt intake during pregnancy to avoid or reduce edema, an associated symptom of toxemia, has gained widespread acceptance in practice. The effectiveness of limiting salt or giving diuretics has been raised by Kraus, Marchese, and Yen (1966). In a double-blind study, they found no difference between the frequency of occurrence of pre-eclampsia in two groups. One group received diuretic treatment during the last 16 weeks of pregnancy and the other group did not. Toxemia of pregnancy is a common disorder encountered in about six or seven percent of pregnancies after about 24 weeks of gestation. It is generally accepted that it results in an increased perinatal mortality rate and an increased rate of premature labor. The rates increase with greater severity of toxemia. The adverse effects of toxemia on the infant are indirect since no specific lesions have been identified with the disease. Such infants do, however, show a "perinatal distress syndrome". As a result of asphyxia and shock (Gruenwald, P. and Connell, J.N., 1958) the adverse effects noted in the neonate are: 1) an increase in premature births; 2) interference with fetal oxygenization

as a result of placental insufficiency and convulsions in the mother; 3) interuterine growth failue; and 4) direct and indirect effect of drugs administered to the mother. Long-term effects of these immediate responses can include minimal brain dysfunction, brain damage and mental retardation.

Another nutritional and health consideration involves maternal weight gain during pregnancy. Thompson and Billewicz (1957) found the average weight gain for healthy pregnant women in Scotland to be 27.5 pounds. This rate of gain was associated with the lowest overall incidence of pre-eclampsia, low-birth weight in infants, and with a relatively low perinatal mortality. Earlier, Tomkins (1955) in Philadelphia completed a similar study and found the optimal weight gain to be approximately 24 pounds.

Prenatal factors causing prematurity are not definitive. Associated factors include cigarette smoking and maternal weight (Ferris, 1968). Ferris (1966) noted that in view of the higher rates in low economic groups and in poor countries, it would appear urgent to reopen the issue of maternal nutrition and its relationship to prematurity.

Watson (1972) has provided further information concerning factors related to low-birth weight infants. He indicated that one-third are not premature and that one-fifth of these have congenital anomalies or congenital infections. Seven percent are a result of multiple pregnancies and 20 to 25 percent occur in mothers with cardiovascular or renal disease. The problem of low birth-weight infants will be more extensively reviewed in Chapter III.

Placental Abnormalities

Placenta previa has shown subsequent correlation with fetal

damage (Baird, Walker and Thomson, 1954). According to Barnes (1968), prevention of the condition is not available. Placental insufficiency is a comparative rather than an absolute diagnosis, but one which might well contribute to fetal hypoxia. Hypoxia is one of the major known causes of mental retardation in the State of Idaho (Table 6). Barnes (1968) reported that major problems surrounding placental insufficiency prevention are early detection, certain diagnosis, and appropriate treatment procedures.

Interuterine Infections

The following viral infections have been strongly associated with congenital abnormalities: rubella, herpes zoster, mumps, coxsachie, and vaccinia (Barnes, 1968). The following maternal infections contribute either to neonatal illness or prematurity: toxaplasmosis, serum hepatitis, equine encephalitis, cytomegalic inclusion body virus, non-specific bacilluria, malaria and possibly brucellosis (Masland, R.L., 1962).

Preventative strategies include those used by preventive medicine. For those diseases that produce lifelong immunity, immunization of the entire population provides protection for all. The development of an immunization serum is, however, an often long and difficult process. The detrimental impact that rubella could have upon the developing embryo was noted early in the 1940's; however, development of a safe immunization serum took until the later 1960's. In the mid-sixties a rubella outbreak occurred in the United States and an estimated 35,000 retarded children were brought into the world because of the uncontrolled virus.

Drugs

Since the thalidomide tragedy of 1960-62, pregnant women have been in a quandry about taking common medication on their own initiative and physicians have been troubled about prescribing drugs for them.

Table 7

Causative or Related Factors
Contributing to Crippled Children
Other Than Mental Retardation
in the State of Idaho
1969-1970-1971*

FACTORS	PERCENTAGE RANGES
Congenital Anomalies	70-80%
Trauma	15-20%
Illness or Infection	5-10%

*Data collected by Crippled Childrens Services and supplied by Ralph Carpenter

Reviews abound concerning drugs administered during pregnancy and their potential impact upon the fetus. Apgar (1965) and Meester (1964) have reviewed the problem and discussed the possible impact of drugs from both the positive and negative aspects. The problem of specific drugs itself, remains largely a medical and research problem having little implication for programming in Idaho.

Maternal Disease

One of the greatest benefits of regular prenatal care is the recognition of maternal disease. Conditions readily recognized as leading to less than optimal outcomes include thyroid disorders, diabetes, heart disease, etc. The recognition of these and other maternal disease conditions, together with their appropriate therapy, represents one of the contributions that can help identify fetal problems before and after birth. Knowledge of this type should enable the general population to understand the need for and utilize preconceptional examinations (Barnes, 1968).

Tables 6 and 7 present data related to the known causes of mental retardation, neurological disorders, orthopedic, congenital heart, cleft lip and palate, cystic fibrosis and plastic burn, seen in crippled children's clinics throughout Idaho. Congenital anomalies are now the number one category under which handicaps, other than mental retardation, fall. Of the identifiable factors related to mental retardation, prenatal influences including congenital cerebral defect and anoxemia at birth (a perinatal condition) account for over 62 percent of the cases observed in clinics throughout the State.

TABLE 6

Causative & Related Factor Sub-Categories
Contributed to Mental Retardation for Idaho
Compiled for 1968-1970**

	*Region 1	Region 2	Region 3	Region 4	Total	Percentage
INFECTION						
Prenatal infection	6		1	2	9	6.7%
Postnatal cerebral infection	3	2	2		7	5.2%
INTOXICATION						
Toxemia of pregnancy	2				2	1.4%
Other maternal intoxicants	2				2	1.4%
Other	1				1	.7%
TRAUMA OR PHYSICAL AGENT						
Prenatal injury	3		1	3	7	5.2%
Anoxemia at birth	16	1	3	3	23	17.1%
Postnatal injury	2	1	2	1	6	4.4%
METABOLISM, GROWTH OR NUTRITION						
Other	3		1		4	2.9%
PKU	1			2	3	2.2%
Galactosemia	1				1	.7%
Carbohydrate metabolism disorder	1		3		4	2.9%
NEW GROWTHS						
Intracranial neoplasm		2	1		3	2.2%
Tuberous sclerosis	1				1	.7%
PRENATAL INFLUENCE						
Cerebral defect, congenital	8	3	5	6	22	16.4%
Mongolism	17	4	3	11	34	25.4%
Lawrence-Moon-Biedl syndrome			2	1	3	2.2%

*Regions are as follows: 1=Northern Idaho; 2=Southwestern Idaho; 3=South Central Idaho; 4=Eastern Idaho
**Data courtesy Crippled Childrens Services

Environmental Stress

During the early 1960's the relating of environmental stress to behavioral and physiological responses of the organism caught the interest of several investigators. The same type of environmental stress was found to result in different physiological responses in different individuals. Because of the discovery that environmental stress can create different emotional states in the individual and that these are accompanied by physiological changes, the question of the impact of these changes upon the developing embryo or fetus arose. During the 1960's, evidence was presented by several investigators that emotional attitudes and behavior of the pregnant woman may affect the child she carries (Montague, 1962; Ferreirs, 1965; James, 1969; and Hultin, Ottosson, 1971).

When scrutinizing the evidence presented concerning possible repercussions on the fetus from the emotional state of pregnant women, it becomes clear that studies are based on retrospective as well as prospective techniques. The former category includes an investigation by Stream and Peer (1965) who maintained that pregnancies leading to children with cleft palates had been more stressful than previous or subsequent pregnancies in the same women. Scott (1957) found that mothers of mentally retarded and physically handicapped children had been subjected to greater emotional shock during pregnancy than those of an appropriate control group. Gunter (1963) reported that mothers of premature children had a larger number of psychosomatic and neuropsychiatric symptoms. They also had more stressful life experiences than mothers of normal weight children.

It has been claimed that distress, anxiety, and a negative attitude during the later phase of the pregnancy are associated with and may be the cause of deviant child behavior such as crying, sleeping, bowel

movements, feeding, and other behavior during the neonatal period (Sontag, 1944; Ferreira, 1960; Ottinger and Simmons 1963, 1964). A more recent study by Hultin and Ottosson (1971) found an increased rate of malformations (1.8 percent) among women who were not granted abortions as compared to appropriate controls whose rate was 0.8 percent. The common consensus is that women who are not granted legal abortions suffer, on the average, more distress and anxiety and have a more negative attitude toward the pregnancy than women not requesting abortion service.

Another study in Sweden followed up 120 children whose mother's requests for abortion had been denied. They were comprehensively studied over an extended period and compared with an appropriate control group (Forssman and Thume, 1966). Compared with other children, the unwanted children were more apt to be born out of wedlock, to be given out for adoption, to have an insecure childhood, to require psychiatric help, to be less educated, and to become juvenile delinquents. Another study of 249 Swedish women, whose request for abortion had been denied, established that 77 percent had made a difficult or poor adjustment (Hook, 1963).

The question of abortion is,to say the least, controversial. Slightly over half of the Idaho physicians answering the questionnaire (51 percent) stated that abortion laws in the State should be liberalized. The remaining physicians (49 percent) were satisfied with the present laws. In contrast about two-thirds (65 percent) of the physicians stated that they did provide abortion referrals. This means that some physicians did not want abortion laws liberalized in Idaho, but they did send patients out-of-state for abortions.

Most physicians agreed that abortions should not be used as a method of birth control and that the use of contraception is best. Comments on abortion ranged from one extreme to the other. Of the physicians against legalizing abortions in Idaho, some felt that abortions should be provided only for health reasons. Others indicated that neighboring states provide abortion services upon request, so Idaho doesn't need to legalize abortion. Physicians who favored liberalization of abortion in Idaho felt that it should not be necessary for a woman to go to another state. They indicated that the question of abortion should be a concern between the patient and her physician. One physician termed the question a "medical and social problem, not a moral or legal one". He expressed his feelings as follows:

> "I am not for mass abortion. I am, however, inclined to place the needs and demands of society over the rights of the unborn fetus. It seems to me that there are some unwed mothers (and also those married) that, after becoming pregnant deem it necessary to view the situation as a mistake, i.e., the 14-year-old girl who impulsively has intercourse as a revenge mechanism towards her parents or the mother of 4-5 children who misses a pill. For a select group (to be determined by the family physician, religious counselor, and the wishes and desires of the parents or girl involved) <u>abortion is a necessity</u>."

> "In Idaho we do not give those who wish it a fair chance. If a girl becomes pregnant, we do not counsel to ask her if she wishes this child; we assume she does. We give her free prenatal care, hospitalize her, deliver her, and <u>even</u> give her the baby to <u>play</u> with as one would give a child a doll! Those of us opposed to abortion argue the rights of a mass of cells, a parasite. We forget, or perhaps conveniently deny the right of a liveborn illegitimate child to have a mother and father to raise him in a way that will at least help him to assume a useful role in society. Instead, we guarantee a disturbed

> mother and child a free ride on the "welfare train" at the expense of this child. I say, yes we need abortion. We need to offer this to mothers that will not or even perhaps will never care for their children. But further we need to insure the rights of the liveborn child."

The survey found some physicians under the impression that the Social and Rehabilitation Services does not pay for voluntary sterilization procedures. However, S.R.S. does pay for sterilization procedures or birth control pills, but there is a problem concerning abortion. If a woman receiving subsistance payments (S.R.S.) desires an abortion, she must not only go out-of-state, but pay for it herself since abortions are not legal in Idaho. Thus this option is not open to someone on S.R.S. rolls, and more children are added to the welfare lists.

Of the physicians sampled across Idaho, 53 percent indicated that in their experience the poor were the least likely to receive abortions after making initial inquiries. Several other physicians indicated that cost was not a factor in obtaining an abortion and thus, it was within the grasp of all in their community. Variation in response was probably, in part, based upon community differences.

In 1967, California liberalized their abortion procedures. From 1960 to 1970, the number of abortions quadrupled to 65,000. Because of the liberalization there is beginning to be a reduction in the supply of children who become welfare recipients through Aid to Dependent Children and Foster Child Programs. The birth rate to AFDC recipients has dropped twice as much as the California average (Davis, 1972).

While the denial of abortion requests has an impact upon the child and mother, the granting of such requests also has later consequences. In a study, 132 mail questionnaires from women who had undergone abortion over a period of time were analyzed for an emotional sequelae (Niswander and Patterson, 1967). They found that 25 percent of the women reported short-term unfavorable reactions. However, only five percent reported long-term unfavorable reactions and 95 percent stated that abortion was the answer to their problem.

A mental health study of about 50 abortion patients in one large metropolitan hospital found that 92 percent of the women were either improved or were no worse for the experience (Peck and Marcus, 1966).

Abortion data from Idaho is difficult to accurately obtain; however, during the survey each physician was asked the number of initial requests he received; the proportion of those ultimately receiving abortions; percent married; and high risk. The data proved interesting and are presented in Table 8.

TABLE 8

Estimates of Idaho Residents Requesting and Receiving Abortions; Percent Married and Considered by Physicians as High Risks During a one Year Period (1971 - 1972)

	Northern & Western Idaho	Eastern Idaho	Total
Number Requests	3,872	2,433	6,305
Number Receiving	3,368	1,407	4,775
Percent Married	28.5%	9.3%	17.3%
Percent High Risk	10.4%	3.2%	7.6%

The above figures could be inflated or minimal. Inflation could be caused by a patient visiting more than one physician in the service pattern without the physician's knowledge. A minimal estimate could be caused by women leaving the State without contacting a physician in the service pattern. In order to attempt to obtain collaborating data, entry points to the abortion referral system in the Treasure Valley were contacted and data was obtained concerning their monthly volume. Figure 6 below shows the combined monthly, new referral volume for the five input points. The initial work-up is completed in Idaho and the abortion is performed in another state.

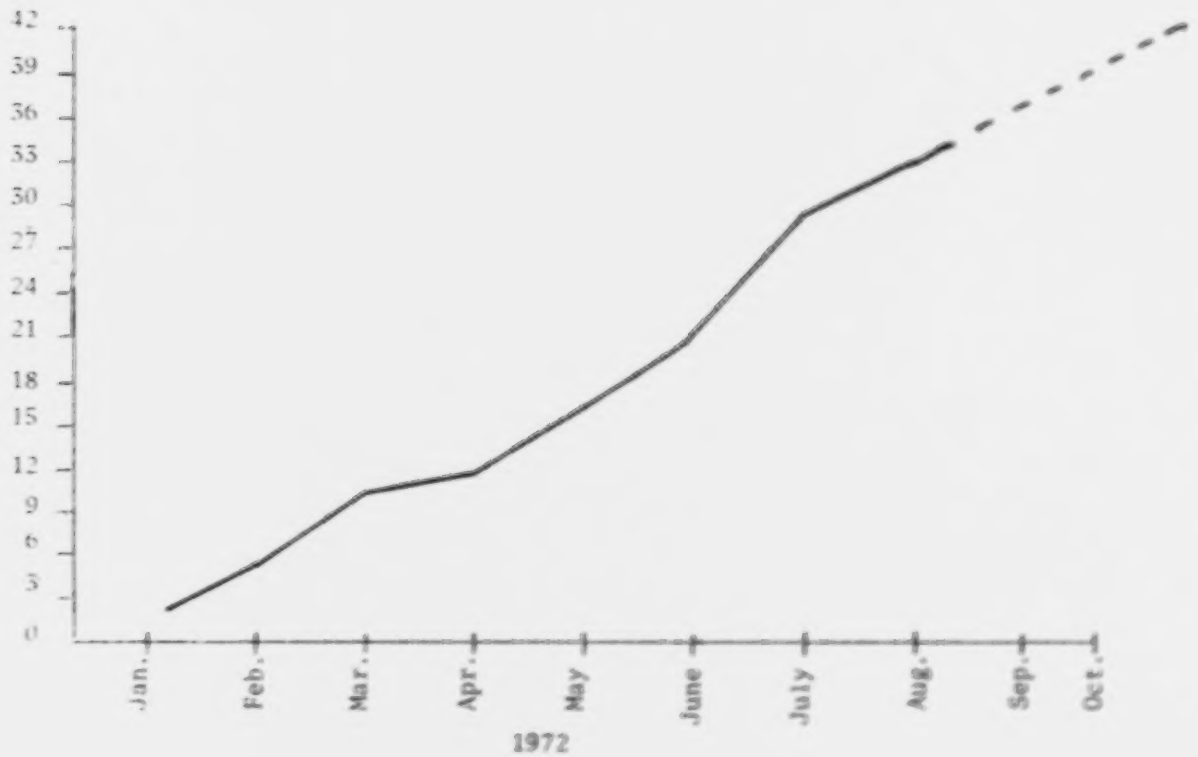


Figure 6. The number of new patients taken into the abortion referral and work-up system at 5 points in the Treasure Valley.

As can be seen from the graph, the volume increased considerably from January 1972 to August 1972 and was showing no signs of deceleration. This information probably correlates with the fact that about 30 percent of the children born to mothers between the ages of 15 and 19 in the Treasure Valley area during 1970 were illegitimate.

As can be seen in Table 8, a substantial portion of those requesting services are married (percentage varying with region). Statewide, 7.6 percent of those requesting services were considered high-risk pregnancies. The volume of abortion referrals is apparently still increasing perhaps more in the Southern part of the State than in the Northern part. The precision of the data presented in Table 8 can be questioned; however , the true value of initial requests is probably within 1,500 of our estimated value and the number ultimately receiving abortions is probably within 1,000 of the true value.

Subpopulations

Health care received by lower socio-economic, teenage, and minority groups has been notoriously poor (Baird, 1970). Economic considerations and lack of education have traditionally been identified as factors preventing these subpopulations from seeking adequate care. With migrants, the problem of continuity of care is perpetual.

A migrant survey conducted by Meade (1972) in the Treasure Valley area found that slightly less than 80 percent of the families interviewed had had one or more members of the family visit a doctor in the last six months. About 47 percent indicated that they felt language was a barrier preventing adequate communication between them and their physician. About 57 percent indicated that there had been times when

they wished to seek medical care but did not. In addition to this, 73.3 percent reported that the lack of money was the main reason for not obtaining care. Thirty-four percent indicated lack of transportation, and 19.8 percent indicated the language barrier as the main problem. Also 17.2 percent indicated that they had been refused medical services at some point during their life.

One problem specifically mentioned several times by Idaho physicians was that, in general, Native North Americans and migrant workers don't keep their appointments. Idaho physicians indicated that non-utilization of care was also prevalent among very young patients and S.R.S. patients. The failure of these subgroups to utilize care was attributed to lack of education.

Physicians Suggest Improvements for Consumers and Systems

Physicians responding to the survey felt that the prenatal care available in Idaho was in general adequate. Over half the physicians volunteered no ideas for improvement in prenatal care. The ideas that were suggested could be classified into the following categories: 1) education of the public; 2) alternate health care delivery systems; and 3) more medical personnel. Generally, physicians felt that education of the public was a greater problem than transportation. They indicated that transportation was within reach of everyone, even in remote sections of the State; and that it did not contribute to poor prenatal care.

Specific suggestions concerning the improvement of patient education included the use of television for educational presentations. Time-honored prenatal classes usually offered by hospitals, were viewed

favorably by physicians. Several physicians felt that educational programs should be instituted at the high school level. They felt that many teenage pregnancies could be avoided if appropriate educational avenues were opened. Such educational avenues could help combat poor prenatal care as well as ignorance concerning conception, birth control, etc.

The kind of family planning services utilized by physicians varied widely. Some physicians provide the service and some refer to family planning classes or clinics. Most physicians feel that additional services are needed; specifically in the areas of sex education, contraceptive advice, contraceptive provision, and religious counseling. They indicated that special efforts for education of indigent and migrant populations should be initiated.

Suggestions as to types of health systems that might improve prenatal care included encouraging "private" care as opposed to "clinic" care. Those who mentioned this felt that private care was more conducive to a good physician-patient relationship and, thereby, resulted in better prenatal care. However, many physicians recommended increasing the number of prenatal and family-care clinics as an efficient means of making prenatal health care readily available to everyone. In particular, one suggestion was for a system of satellite prenatal clinics combined with transportation to a major medical facility for delivery and more specialized care.

Many physicians felt that better care could be provided by increasing the absolute number of physicians available in a community or area. In this way, care would be more readily available and patients could take better advantage of regular prenatal visits. Using additional

personnel, such as public health nurses, medex, and nurse practitioners was viewed favorably by some physicians; however, a couple of physicians had their doubts about the quality-control factor involved in such a system. One specific suggestion was for the earlier use of vitamins and folic acid for pregnant women. Other suggestions included the increased use of aminocentesis and preconceptional counseling.

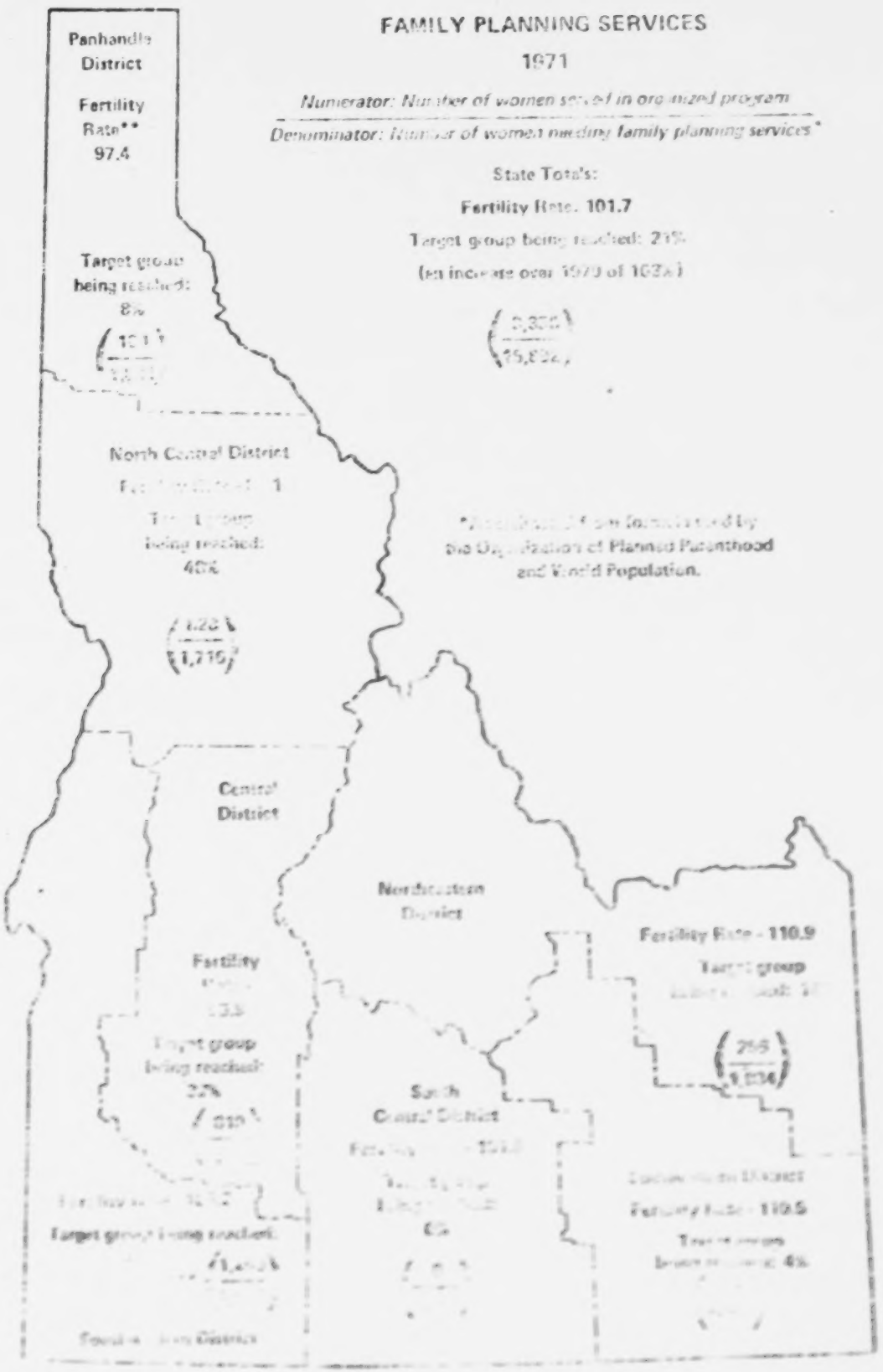
Public Service Vendors

Within the State of Idaho, the Department of Maternal and Child Health provides preconceptional and prenatal services. Their major goal is to promote optimum health for mothers and children. Public health nurses carry out the major frontline activities which include home visits, child health conferences, immunization clinics, services to unwed mothers and family planning programs.

Family planning services rendered statewide during 1971 reached 21 percent of the target group which is defined as low-income mothers. Health districts which reached less than the 21 percent minimum were located in Central, Eastern, and Northern Idaho. Map number 1 provides additional information and was originally published as part of Idaho's Critical Health Indices. S.R.S. utilizes the family planning services of the health districts when consultation is needed; hence, the above data would in part reflect referrals from one agency to another. During 1971, S.R.S. had 428 clients served by the District Health Department's Family Planning Clinics. S.R.S. clients constitute 14.7 percent of the target population served.

Planned parenthood is another organization providing services primarily in the Treasure Valley area. Their emphasis is public education and counseling. If additional service is needed, referrals are made to Public Health District offices.

Map 1


FAMILY PLANNING SERVICES
1971
Numerator: Number of women served in organized program
Denominator: Number of women needing family planning services*
State Total's:
Fertility Rate- 101.7
Target group being reached: 21%
(an increase over 1970 of 103%)
Panhandle District
Fertility Rate** 97.4
Target group being reached: 8%
North Central District
Target group being reached: 40%
Central District
Northeastern District
Fertility Rate - 110.9
Target group
South Central District
Fertility Rate - 119.5
Target group being reached: 4%
*Estimated from formula used by the Organization of Planned Parenthood and World Population.

Map 2

UNWED MOTHERS PROJECT
FY 1971
Numerator: Unwed mothers receiving comprehensive care, FY 1971.
Denominator: Illegitimate births, 1970.
State Totals:
356
969
Target group being reached:
37%
Panhandle District
6
106
North Central District
35
91
Target group being reached:
Central District
19
110
Target group being reached:
17%
Northeastern District
Target group being reached:
67%
South Central District
33
134
Target group
27%
41
101
Target group

Prenatal classes and care have been part of public health system programming for some time. Data reported by the North Central District indicates that 107 clients received educational and prenatal care during 1971. During the same period of time, the Central Health District provided classes and service for 346 clients. During 1971, 637 women in the North Central District and 1,147 in the Central Health District gave birth to their first child. No information is available concerning the composition of the clientele group with relationship to relevant variables such as socio-economic status, marital status, parity, etc.

Unwed mothers constitute a high-risk group as already noted in earlier discussions. It is estimated that about 1,000 births or more, annually, in Idaho are to unwed mothers. In fiscal 1971, 356 or about 40 percent of the unwed mothers in the State received care through the Unwed Mothers Program sponsored by the Maternal and Child Health Division of the Department of Environmental Protection and Health. Map number 2 originally published in the Critical Health Indices gives additional information.

Although the project has not provided service for a large number of unwed mothers, preliminary indications are that infant mortality for the group is approximately equivalent to that of married women in the State of Idaho.

The Agency Services Survey conducted by the Idaho Office of Child Development revealed that several agencies place emphasis upon nutritional training; however, no agency had pregnant women as a specific target group.

Minority groups usually have rather extensive unmet health needs. Several clinics have developed within Idaho to serve their needs; however, no uniform or coordinated effort has as yet been developed to insure

continuity of services. This statement applies to all health services, as well as prenatal care.

The Prenatal, Perinatal, and Postnatal Survey revealed that few physicians within the State utilize genetic diagnosis and counseling as frequently as it is recommended. All obstricians within the State indicated that they had access to genetic diagnostic services; however, 22.2 percent of the general practitioners indicated that they did not have access to genetic diagnostic services.

Genetic counseling was used by 60.5 percent of the general practitioner and obstetric groups combined. It accounted for only 1.2 percent of the total caseload. Theoretically 5 percent to 20 percent or more of the Idaho population will at one time or another need genetic counseling both prior to conception or after delivery in the case of a less than optimal outcome.

SUMMARY

Major services that promote optimal development include preparent training, genetic diagnosis and counseling, preconceptional examinations, and prenatal supervision and care. Preparent training can prevent unwanted pregnancies and provide information necessary for optimal child development.

Genetic counseling can have an impact upon the production of chronically disabled individuals. Metabolic errors and mongolism in the State of Idaho account for over 30 percent of the known causes of mental retardation. Other less frequently occurring physical anomalies also require genetic services. A broader definition, as discussed in the first chapter, would include certain types of mental illness, etc.

A conservative estimate is that at least five percent of the Idaho population should use genetic diagnosis and/or counseling services. A review of utilization by physicians indicates that just over one percent of their caseload used genetic services. Genetic services can reduce the occurrence of severe conditions which may ultimately lead to dependency upon the State. This is especially true of mongolism, mental illness, etc. Thus, to promote optimal development, genetic services are an essential component in the service system.

Preconceptional examinations can reveal maternal conditions which might result in less than optimal outcomes. Such outcomes include congenital anomalies which account for 70-80 percent of the non-retarded, crippled children seen in clinics throughout the State. Preconceptional visits also allow for review of previous pregnancy outcomes - a highly reliable method of predicting future outcomes. Utilization of preconceptional examinations is low in the State. Several physicians alluded to their use-

fulness and indicated a need for public education to enhance the utilization of such services. These services are preventative in nature and enhance the potential for optimal child development.

Prenatal supervision and care throughout the State is relatively uniform. Suggestions to improve the vending of services included the use of nurse practitioners, Medex, etc. Specific suggestions included the general use of vitamins, folic acid, and aminocentesis. Public agencies vending prenatal care appear to be reaching 30 percent or less of the low-income group throughout the State.

Consumers of prenatal care appear to vary considerably in their utilization of the services. Certain geographic locations show poor use during the first trimester. This trimester is the critical one during which viruses, drugs, etc., can have a major impact upon the differentiating embryo. Subpopulations such as teenagers, lower socio-economic groups, and minority groups seem to be less well-cared for and; contain within their populations greater risk prevelancy.

The lack of conceptional planning and the frequent occurrence of unwanted pregnancies in Idaho presents the major problem uncovered by the Prenatal, Perinatal, and Postnatal Survey. In 1970, over 30 percent of the children born to a mother between the ages of 13 and 19 in the Central Health District were illegitimate. Abortion request estimates from physicians would indicate that between 4,500 to 6,500 inquiries per year are made in the State of Idaho. Over 17 percent of the requests are married women at the time of the inquiry. Information obtained through physicians interviewed indicated that as high as 87 percent (Northern and Western Idaho) of those making inquiries ultimately received abortions out of State. Over 50 percent of the physicians reported that in their communities it was the poor who were less likely to obtain an abortion after making an inquiry.

Fifty-one percent of the physicians interviewed favored liberalizing the abortion laws while 65 percent made abortion referrals.

Studies concerning the consequences of granting or not granting abortions upon request indicated that there is possibly less risk (to the woman) in granting the abortion than not granting it.

Family planning services rendered by the State reached only 21 percent of the target group (low-income) during 1971. Private physicians also provide information concerning family planning. They also indicated a pressing need for public education at the high school level to promote responsible parenting.

PERINATAL AND POSTNATAL CONSIDERATIONS

Labor and Delivery

Newborn infants can die or incur permanent damage from dangers that center around labor and delivery. Not all obstetric hazards resulting in mortality or morbidity are preventable, but a great many can be rapidly and skillfully managed. The Council on Pediatric Practice of the American Academy of Pediatrics reported that the following conditions are less likely to result in an undesirable oucome if sufficiently trained personnel and adequate facilities are available (1970).

1. The proper treatment of the toxemic mother.
2. Prompt management of delivery of the mother with placenta praevia or abruptio placentae.
3. Proper delivery of babies with abnormal intrauterine presentations.
4. Medical treatment of mothers known to have infections immediately preceding labor and delivery.
5. Rapid action when prolapse of the cord occurs.

The above conditions are considered as casual for outcomes involving mental retardation, cerebral palsey, and epilepsy. Infections (prenatal), birth trauma, neonatal anoxia and fetal-maternal blood factors can result in hearing impairment. Some prenatal and perinatal conditions (Wallace, 1962) can lead to blindness, however, the major causes appear to be genetic and developmental. Prematurity, maternal-fetal blood incompatibility, bleeding and toxemia are frequently predisposing factors for children with orthopedic, neuromuscular and neurological conditions (Wallace, 1962).

In order to determine the nature of problems surrounding childbearing that could lead to less than optimal outcomes, twenty-six hospitals throughout the State of Idaho were visited. A random sample of records (maternal and child) were pulled and reviewed. Out of 101 records reviewed the following problems appeared.

TABLE 9

Complications associated with pregnancy which threaten an optimal outcome and services needed for prevention or intervention. A sample of Idaho hospital records.

Problem	Frequency of Occurrence	Service
Thyroid dysfunction	2	F.P., P.E., M.M.
Diabetes in family	7	F.P., P.E., G.C.
Maternal diabetes	1	F.P., P.E., G.C., M.M.
Leukemia	1	F.P., P.E., G.C., M.M.
Suicide attempt	2	S.S.
Premature birth	3	P.E., M.M.
Hypertension	1	P.E., S.S., M.M.
Arthritis	1	P.E., G.C., M.M.
Congenital anomalies	3	F.P., P.E., M.M., G.C.
Anemia	2	M.M.
Mother, emotionally upset	1	F.P., S.S., G.C.
Mother, mental retardate	1	F.P., S.S., G.C.
Maternal ulcer	1	P.E., M.M.
Maternal seizures	1	F.P., P.E., G.C., M.M.
Hypoglycemia	1	S.S., M.M.
Urinary infection	1	P.E., M.M.
Delivery by caesarian section	1	M.M., F.P., P.E.
TOTAL (NOT CUMULATIVE)	26	

Abbreviations for Services are as follows: F.P. = Family Planning; G.C. = Genetic Counseling; M.M. = Medical Management; P.E. = Preconceptional Examination; S.S. = Social Services

The above problems are a mixture of prenatal and perinatal considerations. Many of them could have been handled more adequately if appropriate services (column 3) were available or if the consumer would have utilized existing preventative services.

Prematurity represents a major perinatal problem. We know that two-thirds of infant deaths are directly or indirectly associated with prematurity. In addition to this, premature babies are more susceptible to acute and chronic disabilities plus presenting a substantially more complex care problem for parents. During the last decade the nationwide incidence of prematurity has steadily increased to its present level of ten percent. During the last decade there has, however, not been a noticeable increase in prematurity (Figure 7) in the State of Idaho.

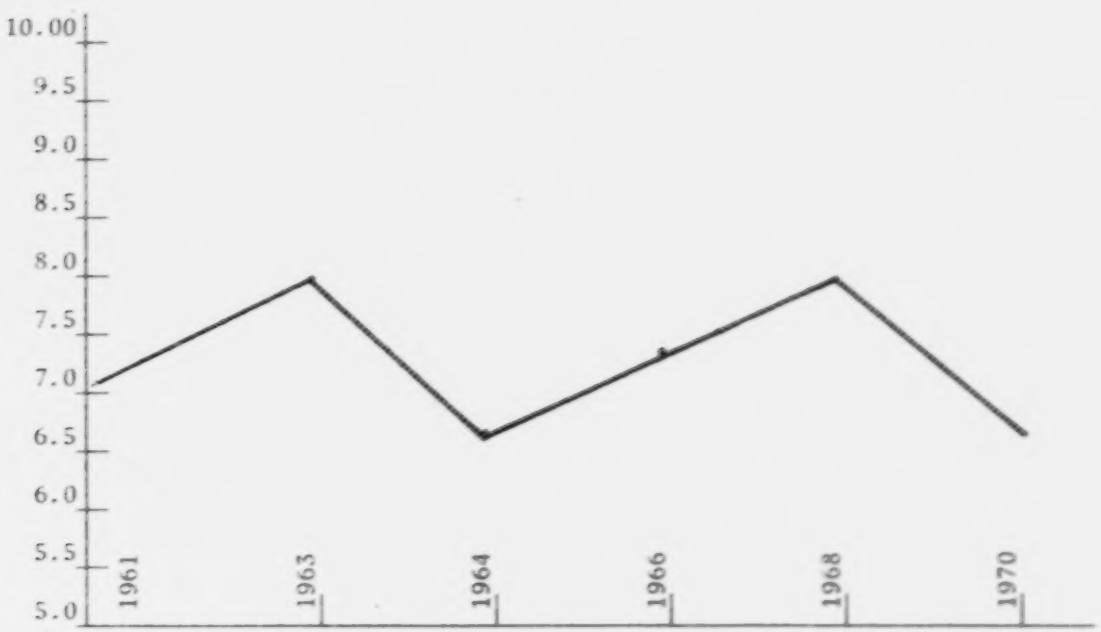


Figure 7: Percent of premature children born in the State of Idaho over the last decade.

The Idaho criteria for prematurity includes the following:

1. 5 lb. 8 oz. or less.
2. 36 Week gestation or less.

Thus the Idaho definition could include a small full-term baby. In this context, prematurity means a low birth weight as compared to a full term normal child.

Gold (1968) has spent extensive time researching the problem of prematurity. From his work he concluded the following:

1. Cigarette smoking during pregnancy is associated with lower birth weight.
2. Maternal weight gain is associated with prematurity.
3. Mothers of prematures tend to have repetitive premature births.

Flowers (1968) reviewed the occurrence of optimal pregnancy outcomes and concluded that the most favorable circumstances would be: both parents should plan and desire pregnancy; they should be between the ages of 21 and 25, of average height, weight, intelligence, and affluence; and there should be no previous history of a reproductive failure, medical disease, or infections. According to him, the above conditions would promote optimal pregnancy outcomes including the reduction of prematurity.

Stone (1968) was more specific in identifying factors related to prematurity. He named severe toxemia, eclampsia, and CHVD as significant etiological considerations. He stated that antepartum hemorrhage of all types were associated with an extremely high incidence of prematurity. He also found neuropsychiatric disorders and repeated caesarean sections associated with prematurity.

Neonatal Period

Risk Factors

Many acute prenatal conditions can threaten the life and

future of a newborn infant, including rubella and congenital pneumonia. During parturition,herpes virus infection preceded by prolonged rupture of the membranes can threaten the newborn's integrity. In the newborn nursery acute conditions such as skin infections, sepsis, pneumonia, meningitis, and epidemic diarrhea may also take their toll.

Blood factors (hyperbilirubinemia) demand prompt, effective management not only to save the child's life but also to prevent possible brain damage.

Biochemical disturbance such as hypoglycemia can present threats to the newborn. Hemolytic anemia usually requires immediate transfusions, while respiratory distress requires highly skilled personnel and proper facilities for treatment. Such are not often available.

Malformations can be minor or major. Esophageal atresia, intestinal obstruction, anal atresia, and omphalocele are life threatening if early recognition and appropriate action are not taken (American Academy of Pediatrics, 1970).

Table 10 presents data concerning live births, premature births still births, neonatal deaths, and infant deaths for Idaho in 1970. The data has been broken down into health districts so that comparisons can be made between the districts. Infant deaths are highest in Northern Idaho, and have been consistently high for a number of years. Calculation based upon three consecutive years (1968-1969-1070) show that Benewah, Boundary, and Shoshone Counties have high infant death rates. Boundary is the highest with an index of 45.3 followed by Benewah and Shoshone having indices of 28.5 and 25.4 respectively. The infant deaths index is usually used as a general indicator of the community's health status;while the neonatal death rate is

indicative of the mother's health and services provided her (Perinatal Problems, 1971). It is interesting to note that District I also had the highest neonatal death index in 1970 (16.2 per 1,000 live births). This exceeds the national average by about six deaths per thousand live births.

TABLE 10

Vital Statistic Data for Idaho
1970

Health Districts	Live Births	Still* Births	Infant* Deaths	Premature** Births	Neonatal+ Deaths	Neonatal++ Deaths
1	1432	10.4	25.3	5.897	016.20	7.1
2	1410	7.9	13.2	6.200	011.67	5.9
3	1796	13.9	18.9	6.896	014.99	5.9
4	2759	6.6	13.5	5.581	010.14	4.0
5	2004	8.0	19.5	7.622	014.54	9.5
6	2375	14.1	12.9	6.911	009.29	5.6
7	2296	10.5	16.2	6.145	013.60	6.6

* Rate per 1000

** Percent

\+ Rate per 1000 for the first week

\+\+ Rate per 1000 for the first day

As mentioned previously, birth at risk can be defined in several ways. Vital Statistics data lends itself to analysis using the following criteria for births at risk:

1. Births before a maternal age of 20 years and after 29 years of age.
2. More than four births to a mother.
3. Births spaced too close together.

Births before the maternal age of 20 and after 30 years of age, show greater complications and higher probabilities of a less than optimal outcome. These mothers have proportionally more, low birth-weight infants (Falkner, 1969). A less than lethal outcome whose probability increases with maternal age is Trisomy 21 (Down's Syndrome). Low birth-weight is also a higher probability for children born fifth or later in the sibling order (Falkner, 1969).

Analysis has shown that the neonatal death rate is 35 per 1,000 for deliveries occurring within one year after a preceding delivery. For births with an interval of one to two years, the neonatal death rate goes down to 17 per 1,000. If the interval is two to three years the rate goes down to 7 per 1,000.(Falkner, 1969).

If the above criteria are applied to Idaho births , at least 34 percent of the births in Idaho during 1970 were at risk. During 1971 a total of 2,555 mothers, 19 years of age and below, delivered children. Mothers 30 years of age or over delivered 2,347 children in the State of Idaho. Table 11 presents data concerning the age of young mothers and the sibling order of their offspring.

TABLE 11

Age of Mother by Parity - 1971

Age	Sibling Order			
	1	2	3	4
13	4			
14	21	1		
15	91	3		
16	210	9		1
17	416	55	6	1
18	620	120	15	1
19	739	215	25	2
TOTAL	2,101	403	46	5

GRAND TOTAL 2,555

Older women between forty and forty-eight years of age produced 174 children in Idaho during 1971. The children's birth order ranged from first to sixteenth. This group is especially high risk for handicapped children. All eggs are in the female ovary at birth. No new ones are ever generated, hence as a woman becomes older the cumulative effects of radiation and biological malfunctioning have a substantial impact upon the integrity of her offspring.

Figure 8 shows the number of children born to both the younger and older age groups over a nine-year period. Numbers presented by the graph are based upon births per thousand women. It can be observed that there has been a decline in the number of births early in the 1960's; however, it would appear as though we may now be entering a stable period.

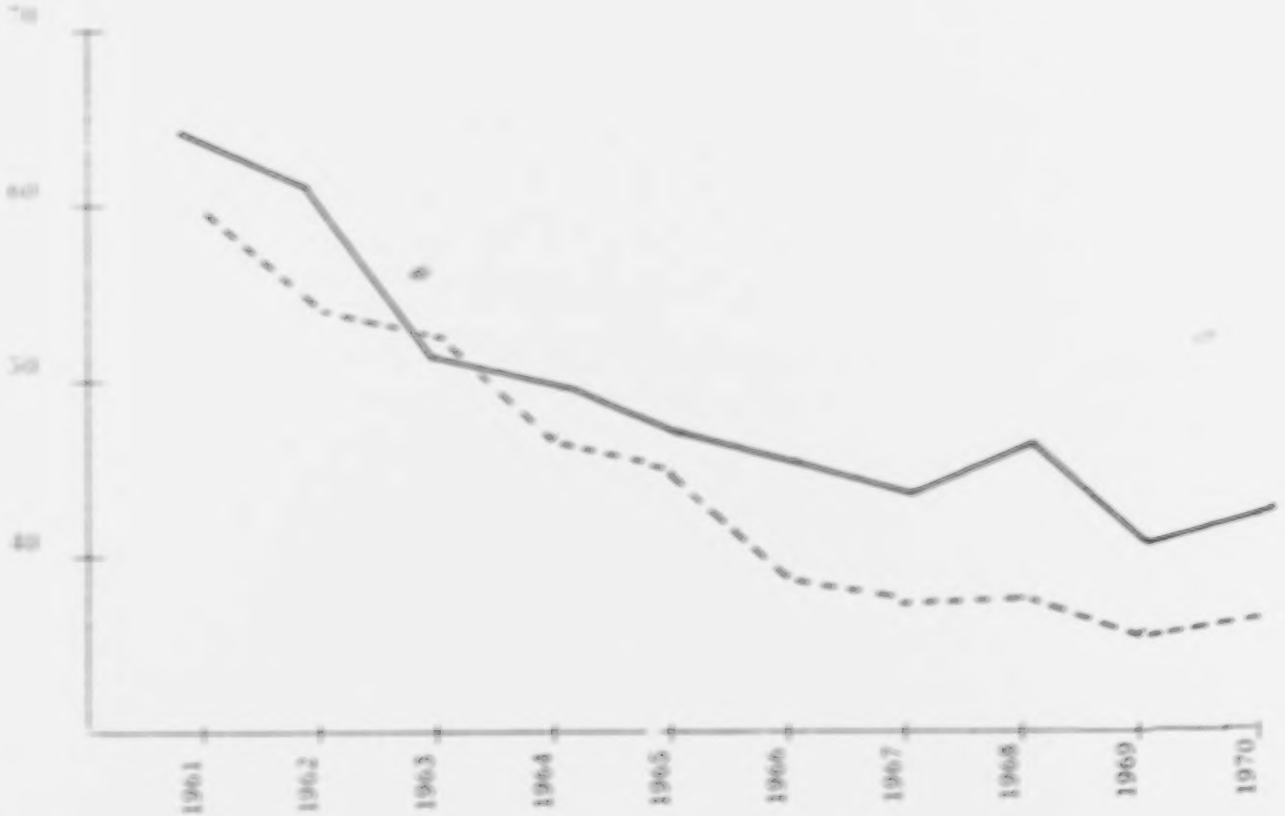


Figure 8. Number of children per 1,000 born to females between ages of 13 and 19 (solid line) and between the ages of 30-45 (dotted line).

Prediction Impairment

The prediction of impairments (sublethal conditions) from prenatal and perinatal factors has been studied by several investigators. Most recently Smith, Flick, Ferriss, and Sellmann (1972) studied the prediction of sublethal outcomes such as cerebral palsy, epilepsy, mental retardation, cerebral dysfunction and learning disabilities. From a combination of 17 predictor variables they were able to correctly predict 76.6 percent of the abnormals and 84.4 percent of the normals. Six of their variables could be removed from the battery without reducing the predictability of their instrument. The study followed children from conception to seven years of age.

A British project, the National Child Development Study, tracked children from birth to seven years of age using a sample of 16,750 children. It was sponsored by the National Children's Bureau in London. They found that by using a "risk register" of prenatal, perinatal, and postnatal factors, 52 percent of the children who were later identified as handicapped were initially on the register. The idea of "at risk" registers goes back to the early sixties when a number of medical officers of health decided to keep registers of children, who on the basis of known birth hazards such as prematurity and abnormal delivery, were considered to have a higher than average risk of subsequent physical or educational handicap.

The British study showed that suitable combinations of birth factors can be used to define "high risk" children. For example, a child having had a serious illness in the first week of life, an abnormal delivery, and a sibling order of fifth or later has at the age

of seven a ten times greater risk of being severely mentally or physically handicapped (Goldstein, 1972).

Results of the study would suggest that the fewer the total resources which are available to a state, the more concentrated they need to be in the area of prevention and early intervention.

Other registers are possible. New York State now has a birth defects register, abuse register, and a mental hygiene advocacy register. The register can provide the State with two types of basic information:

1. A type of social indicator to help monitor and evaluate the success or impact of preventative and early intervention programs.

2. An input mechanism to insure that vulnerable children who need services are taken into the service system. Thus it acts in part as an initial screening mechanism.

Early detection by screening provides a vital link necessary to ameliorate potential handicapping or less than optimal outcomes. The earlier the condition is detected the higher the probability of a desirable intervention outcome with minimal cost.

Social Considerations During Infancy

The first year of an infant's life consists of several maturational and learning changes. His gross motor activity may start with lifting his head and progress through several steps including sitting, rolling over, bearing some weight on his legs, standing by holding on until at about twelve months of age when he walks well (Franhenburg, Fandal, Dobbs, 1970). An infant's fine motor movements may follow a similar sequence of events starting with activities such as symmetrical movements

and culminating near the end of the first year with a neat pincer grasp of small objects.

The infant's personal-social development during the first year starts with responsive smiles and continues through a sequence of activities including playing peek-a-boo, pat-a-cake and ball. At the end of his first year he will begin to indicate his "wants" without crying and he will also drink from a cup.

Prelanguage development during the first year starts with vocalizations, followed by laughs, squeals, imitations of speech sounds; and by the end of his first year he can usually say three words other than mama or dada (Frankenburg, Fandal, and Dodds, 1970).

While most infants progress through the developmental sequences of skills during the first year of life, others do not. Their progress is slow or highly varied across different skills. Infants demonstrating deviant profiles during the first year of life are usually afflicted with moderate or severe mental retardation. The primary prevention of this condition could have occurred only through genetic counseling, appropriate prenatal and perinatal environments. Other problems may have their origins during the first year of life. Abuse and neglect begins to appear; respiratory diseases begin to take their toll; and accidents are frequent, especially during the stage of early mobility. During the first year the problems of prematurity, poverty and illegitimacy also begin to have their impact upon the well-being of children.

Illegitimacy and Its Consequences

The problem of illegitimacy in the nation as well as Idaho, presents a difficult problem. Figure 9 shows one of the most revealing

statistics found by this survey. About one in every three women between the ages of 13 and 19 in the Central Health District whose pregnancy terminates in a live birth will have an illegitimate child. This same District began to show a rise in V.D. statistics during 1968 and 1969, while other districts throughout the State remained stable. Other districts began to reflect the rise in about 1970 and 1971. If the Central District can be used as a lead or predictor district, we may be in for a statewide rise in illegitimacy during the early and mid-1970's. If the trend is indeed upward, it may be counteracted in part by the availability of abortion services in Oregon, Washington, and perhaps Idaho.

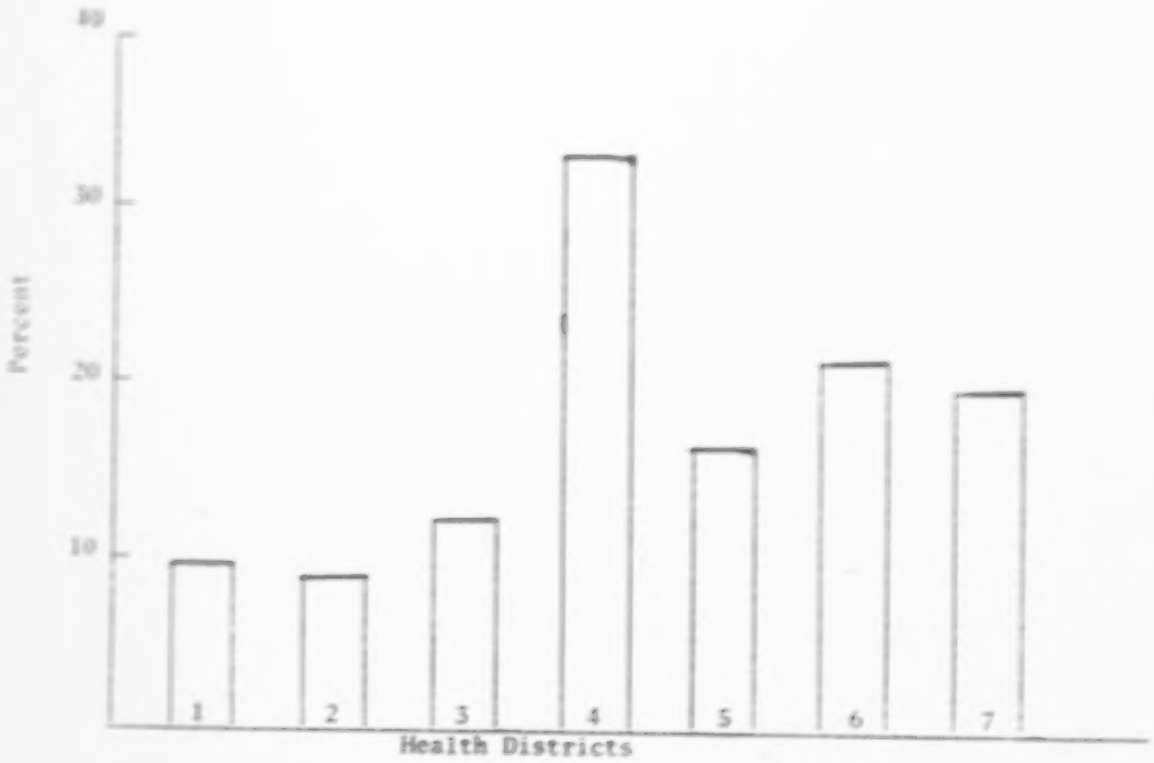


Figure 9. Percent of Illegitimate Births to Idaho Mothers - Ages 13-19
1970

The consequences of illegitimacy are profound. Eileen Corrigan (1970) attempted to answer the question concerning what happens if an illegitimate child returns with his mother to her community. Corrigan's study consisted of a review of 205 mothers five years after their children were born. Her findings indicated that 57 percent of the mothers showed signs of psychoneurotic and psychophysiological disturbances. She also found that 85 percent of the children were still living with their mothers as they approached their sixth birthday. Her major conclusions indicated that the father's (mostly step-fathers) relationship to the child was less favorable than appropriate controls. She also concluded that mothers who keep their children rear them rather adequately, but find their greatest limitation being poverty. These findings correspond rather well with those of Philip Sarrel (1967). Sarrel in a five year longitudinal study found that a sample of 100 girls under 17 years of age with one out-of-wedlock pregnancy had 240 more babies and nine abortions. Only five girls did not become pregnant again in the five-year period and of those who married only nine of the total 100 were still living with their husbands. Sixty of the 100 girls and their children were, at the end of the five-year period, supported by welfare.

Facts such as those presented above have led Arthur J. Lesser (1968) to conclude that programs focusing on young unmarried mothers must be widely extended if we are to interrupt the cycle of continued failure. He indicates the system must include health, education, and social service components. The specific impact of illegitimacy upon the child remains to be investigated by professionals in the field. One study, by Jeanne M. Giovannoni (1970), found more neglect in one-parent rather than two-parent homes; however, upon further analysis these were homes where a separation or divorce had occurred. Her study showed that a child's prospects for receiving adequate care were much less related to his legal status than

to his economic and ethnic status.

The prevention of illegitimacy may be interpersonal in nature and have its roots in family behavior. A recent study (Frank F. Furstenberg, 1972) of 337 unwed adolescents found that the majority of the girls in the study had no unconscious desire to punish their parents, to acquire adult status, or to conform to the attitudes of friends - all favorite explanations in psychoanalytic circles. According to Furstenberg, most were apparently just out to enjoy their sexual relations and never thought they would become pregnant. He found that a mother's influence could be quite effective in preventing illegitimacy when her daughter was involved in a continuing relationship. For brief and rare encounters, 88 percent never used birth control methods; and Furstenberg found no preventative strategy.

Parental Deprivation

The general problem of parental deprivation has been investigated by Daniel Alkon (1971). He contrasted mental health patients to non-patients of equal SES (socio-economic status). His study was retrospective and yielded the following findings:

1. Parental deprivation tends to occur earlier among in-patients than among never-patients.

2. Both among in-patients and among never-patients a direct relationship exists between "impaired" functioning and the incidence of parental loss before the age of seven.

3. Female in-patients, as contrasted with male in-patients, have had in their past a higher prevalence of parental deprivation, as well as, a greater tendency for early parental deprivation.

Alkon's research would lead us to believe that parental loss during early childhood does have an impact upon later functioning.

He, however, did not pinpoint the time or range of loss. Hence, it is difficult to tell if loss during infancy does result in later dysfunctioning. The prevention of parental loss lies in the root causes of divorce, separation, and accidental death.

The divorce rate for the State of Idaho can provide a very general index of developmental environments that may be less than optimal. As noted previously, parental loss during early childhood can have an undesirable impact upon the child's present and later mental health. Figure 10 shows the increase in absolute numbers of divorces occurring in Idaho over the last five years. It should be noted that a small portion of these divorces were granted to individuals who were in Idaho for the express purpose of obtaining a divorce.

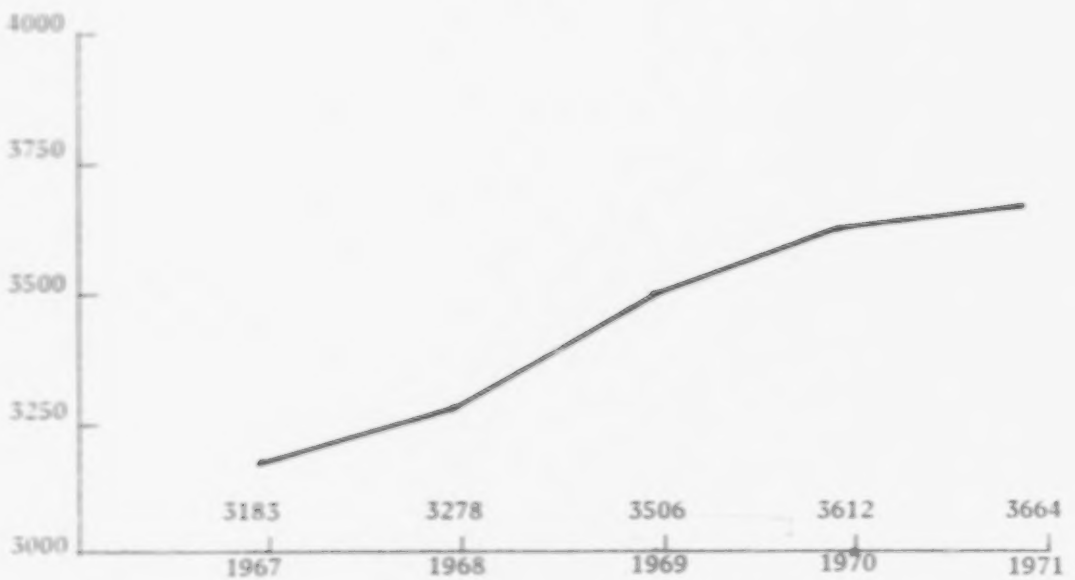


Figure 10. Number of divorces granted in Idaho over the five-year period.

Records concerning divorces in Idaho during 1967 indicate that at least 1,269 children were affected by divorce. Of this number we can estimate that about one-fifth to one-fourth were preschool age. Since this time, the number of divorces has increased as probably has the number of children affected. The rise in divorce rate probably corresponds with increased demands for State supported personal services.

Abuse and Neglect

At least 700 children are killed every year in this country by their parents or parent surrogates. Thousands more are permanently injured physically or mentally. In addition to injured children, there are others who are simply neglected. While failure to thrive can be caused by dozens of medical conditions, about three out of ten children under the age of one, for whom this diagnosis is given, are simply not properly fed or emotionally cared for. (Kempe, 1969). In Idaho 242 infants died in 1970 and about 41 of these were categorized as immature - unqualified deaths. Perhaps this category contains failure to thrive, however, we have no way of knowing at this point without an exhausting review of infant deaths and their causes.

The National Children's Bureau estimates that there are 60,000 children each year who are abused (Wolf, 1972). The American Humane Association estimates that there are about 30,000 each year in the United States (DeFrancis,1972). Using these figures, and assuming Idaho to be typical, between 120 to 240 children in Idaho are being physically abused each year. Calculations based upon the State of Idaho SRS files indicate that only 58 cases were identified in 1971. In July of 1971, SRS issued a report covering 76 children who were physically abused over the past three years.

Table 12 shows the reporting sources and the cumulative number reported by each categorical source.

TABLE 12*

Source of Reports of Inflicted Injuries

Source of Referral	Number of Children
Lay persons, such as neighbors, acquaintances, relatives, etc.	27
Persons having professional and occupational association with children, such as school teachers, counselors, and nurses.	20
Physicians and hospitals	12
Police	6
Courts and Prosecuting Attorneys	7
SRS Caseworkers	4
TOTAL	76

*Table originally published as part of DPA Research Report No. 71-5.

In July (1971), forty-seven of the children were still receiving services from the Department. Of the 29 children whose cases were closed, two had died of injuries received (SRS, 1971). If these figures are correct perhaps between four to six children die annually in the State of Idaho because of abuse.

The actual age of children being abused is quite revealing. Rubin (1966) reported that 70 percent of the children were under three. Thirty-two percent of them were under six months of age. Idaho figures differ from this with a more even distribution over the age range (Table 13). This could lead one to speculate that most of the very young cases in Idaho are going undetected or unreported.

are going undetected or unreported.

TABLE 13*

Age of Children with Inflicted Injuries at Time of Their Referral to DPA

Age	Number of Children	Percent of Total
Less than 6 months	6	7.9
6 months through 11 months	8	10.5
1 year	8	10.5
2 years	6	7.9
3 years	4	5.2
4 & 5 years	10	13.2
6, 7, & 8 years	10	13.2
9, 10, & 11 years	7	9.2
12, 13, & 14 years	11	14.5
15, 16, & 17 years	6	7.9
TOTAL	76	100.0

*Table originally published as part of DPA Research Report No. 71.5.

Kempe (1969) has reported that, by and large, the parents are not psychopaths, drunkards or just "plain mean". He estimates that out of 100, perhaps two or three are psychotic. Two or three more parents may be antisocial or inclined to beat up everybody, including adults. Most parents have a history of emotional deprivation in childhood. They are usually characterized by immature social and emotional behavior (Jacobziner, 1964), however, they usually love their children very much.

The average age for the mother is about 26 and the father 30. Kempe (1969) has emphasized the importance of avoiding stereotypes of the parents. He indicated that if the problem is studied in Baltimore, more parents will be black, however, if it is studied in Salt Lake City, more will be white and Mormon.

Strategies for early detection have been used and are presently being researched. Morris (1972) has listed a large number of early symptoms and predictors. They center around adequate maternal claiming behavior during the early weeks and months of life. The three major behaviors to observe are as follows:

1. Finds pleasure in her infant and tasks done for and with him.
2. Understands his emotional status and comforts him appropriately.
3. Reads his cues for new stimulation and senses his fatigue points. Thus providing the right amount of visual, auditory, and tactile stimulation.

Morris's findings indicate that when the above "claiming process" fails a kind of psychological miscarriage results and maladaptive maternal behavior will follow leading to neglect and perhaps abuse. Intervention and prevention strategies have been tried by many involved in child protective services. Prevention of abuse can be achieved through fertility control.

A National Institute of Mental Health study (Behavior Today, 1972) indicated that pregnancy or recent birth of another child often triggers child abuse. Some families, when they start using contraception successfully or pass child-bearing age, appear to cope better with stress and stop venting frustrations and rage on children. Other methods of preventing child abuse have been tried ;however none have demonstrated outstanding success.

Other Influences upon Emotional and Social Development

Systematic attention has been given to the impact of parental affection upon the child's development. The beginnings of a clear indication of affection and attachment on the infants part occurs during the third quarter of the first year (Schaffer, 1958). One indication of the formation of bonds of affection and attachment is smiling in infants. Around six months of age, indiscriminate smiling becomes more discriminatory and is usually made to only significant caretaking persons (Ainsworth M.D., 1963).

The consequences of emotional neglect upon the development of affection in infants has been reviewed by a number of investigators. Early studies of maternal deprivation report findings which indicate that after six to nine months of age, prolonged or severe deprivation of maternal care or abrupt separation from the accustomed mother figure during the first three years of life sometimes, but not always, leads to serious developmental hinderances. The effects of deprivation may be described as follows:

1. Retardation in motor, language, and intellectual development (Spitz, 1951).

2. Malnutrition and an unusually high infant mortality rate despite excellent medical care (Spitz, 1951).

3. A behavioral syndrome of agitation and weepiness followed by apathy, passivity, lack of interest, stereotype movements, etc.(Fisher, 1952; Roudinesco, 1952).

The critical factors which are missed when a mother or surrogate is not present in the household have been pursued by Beckwith (1971). He found that if the infant was spoken to less, touched less, and had less opportunity to explore the house, the infant then tended to score lower on the infant scale. Similarly more social experiences with people other than the parents tended to enhance scores on the scale.

Collard (1971) contrasted infants in institutions with those in lower and middle class homes. The babies performance appeared to depend on their experience with similar objects and on the extent to which someone had played with them. Hence at least two factors appear to be important to supporting the optimal development of infants. The two factors are the opportunity to explore a varied environment and the opportunity to interact frequently with the mother or an appropriate surrogate.

Ausubel and Sullivan (1970) have summarized the results of several studies and concluded that the effects of separation have not been established prior to six months of age; however, most observers agree that the period from nine months to three years is the most crucial with regard to adequate emotional development.

They (Ausubel and Sullivan, 1970) also concluded that infant experiences give mainly potentialities. What is done with the potentialities is dependent upon later social influences and other conditions which actualize adult behavior. It is difficult to obtain an estimate of emotional deprivation in Idaho.

No direct and accurate index is available to indicate the extent or degree of emotional neglect in Idaho. The Department of Social and Rehabilitation Services is required by law to receive complaints of neglect and abuse. Table 14 below reviews the total number of complaints received during 1972 and the number under six years of age.

TABLE 14

Total number of neglect and abuse complaints received by SRS in 1972 with the proportion six years and under indicated.

	MONTHS											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Six years of age and under	75	82	83	100	78	103	87	111	100	59	87	79
TOTAL number of complaints of neglect & abuse	145	157	160	193	150	198	167	214	192	113	168	152

The above figures include a multitude of occurrences. They may include anything from violent abuse to a neighbor who registers a complaint as a personal vendetta.

Prelinguistic Development and Influencing Factors

Vocalizations during the prelinguistic period are maturationally based. The fact that prelinguistic utterances during the first six months undergo parallel developments for deaf and hearing children indicates the importance of underlying physiological factors (Lenneberg, 1964). Nakazima (1962) has found that there are no differences in the babbling sequences of Japanese and American children until the ninth month.

Imitation of environmental sounds plays a very important role in the development of articulation and the phonological system. According to Fry (1966),at the end of the babbling stage the child begins to control motor speech activity through auditory feedback thus making his own utterances match more nearly the pattern of those in his surrounding environment.

It is at this point or perhaps earlier (note below) that an appropriate environment for language development needs to be supplied for children at risk. Such children would include those that are handicapped because of earlier occurring factors or those in homes where the parents may not provide an adequate speech model (mentally retarded parents, deaf parents, bilingual parents, etc.).

Many other factors can also influence language. Precocity in speech is associated with intelligence and is one of the most striking developmental characteristics of intellectually gifted children (McCarthy, 1960). However, children who lag somewhat in speech onset are not necessarily dull or abnormal. McCarthy (1960) also found that many normally intelligent and even intellectually gifted children are late talkers.

Environmental stimulation is an essential component in determining language development skills. Both adult affection and stimulation correlate with language development progress in children (Anastasi and de Jesus, 1953). This finding has been supplemented by studying institutionalized children who are deprived of adult stimulation. As early as the second month of life, differences become apparent in the variety and frequency of phonemes emitted (Brodbeck and Irwin, 1946). Hence stimulation as early as two months of age may be important to language acquisition and later development.

Motor Development and Related Factors

Maturation appears to play a large part in the development of motor skills. Motor skills can be described as phylogenetic or ontogenetic in nature.

Phylogenetic motor skills develop in a uniform sequence despite marked cultural differences in child-rearing practices. Environmental stimulation does not accelerate; and deprivation of use, within the usual

limits, does not seem to retard their rate of development (Ausubel and Sullivan, 1970).

For ontogenetic motor skill development,the rate and extent of development are largely dependent upon environmental stimulation as well as maturation. When an older child is deprived of early experience in a particular skill commonly available to younger children, he generally begins to learn that skill at the primitive level but progresses more rapidly through the intervening stages to the highly skilled level.

As stated previously, maturation does play a major role in the development of ontogenetic motor skills. In general,one could identify the important causal factors as genetic, motivational, emotional, personality, and environmental.

Little or no relationship exists between a child's social economic status and his rate of development of gross and fine motor skills (Bayley and Jones, 1937). It would appear as though the upper socio-economic group does not have the same experiential advantages here that it has in the development of cognitive skills.

Nutrition

Comparative studies of differential intellectual achievement of malnourished and nourished infants have centered around children who have been hospitalized for serious nutritional illness (marasmus or kwaskiorkor).

As early as 1960, Waterlow, Craviota, and Stephen reported that children who suffered from such severe nutritional illnesses exhibited delays in language development. In Yugoslavia, Cabok and Nojdanvic (1965) compared the IQ levels of children hospitalized for malnutrition at less than 12 months with an appropriate control group. They reported a reduced

IQ in the previously hospitalized group. They also demonstrated a significant correlation between the severity of the child's illness on admission, with depression of IQ in the school years. Birch (1972) reported he and his coworkers compared children previously malnourished in infancy with their siblings as well as with children of similar social economic backgrounds. They found that malnourished children who had been hospitalized for kwaskiorkor between the ages of six and thirty months, demonstrated full scale WISC IQ scores thirteen points lower than sibling controls. Both verbal and performance differences were of similar magnitude and in the same direction.

Cravioto and Robles (1965) studied the developmental course of returning competence in children hospitalized for malnutrition during the period of their treatment and recovery while in the hospital. Their findings indicate that behavioral recovery was less complete in the younger children (those hospitalized before six months of age) than in older children. They posed the possibility that this earliest period of infancy was the one most critical for insult to the developing brain and thus to intellectual potential.

The above conclusion is not entirely supported by a Jamaican study of male children suffering severe malnutrition (Birch, 1972). In this study approximately equal numbers of children having experienced an acute episode of malnutrition in each of the four semesters of the first two years of life were reviewed for developmental integrity. Equivalent depression of IQ was found to characterize each of the groups when separated by age.

After reviewing several studies, Birch (1972) concluded that children who have been exposed to hospitalization for a bout of severe acute

malnutrition in infancy demonstrate an association of significant degree between such exposure and reduced intellectual level at school age.

Clearly the presence of a child hospitalized for severe malnutrition identifies a family in which all children are at a high level of risk for significant under-nutrition on a chronic basis. The hospitalized child only represents the surfacing of more massive problems.

The National Nutrition Survey recently reported (Focus, 1972) that four to five percent of the 40,000 persons studied exhibited symptoms of severe malnutrition. The survey also found that children showed adequate intake of Vitamin A and Vitamin B (Riboflavin). A procedure of the survey was to check the hemoglobin level which indicates anemia or iron deficiency. They found that one-third of the children under the age of six had abnormal hemoglobin levels indicating anemia or iron deficiency.

In general the survey found that regardless of income, ethnic group, or social status, American families tend to make poor food choices that lead to inadequate diets and poor use of money available for food. Families tend to purchase large quantities of meat, with neglect of less expensive foods with high protein content such as fish, poultry, and nuts.

The Service Pattern and Physician's Comments

Postnatal care begins with birth and includes, in Idaho, a PKU test on all newborns plus delivery and discharge examinations. For the physicians interviewed, there was generally a routine schedule of well-baby checks including an immunization schedule. The schedule differed from physician to physician in frequency and timing of visits. Postnatal visits included DPT and OPV series; and most generally, hemoglobin and tine tests were given at about one year of age. Not all physicians

routinely used MMR or smallpox (The World Health Organization has recently recommended discontinuing smallpox vaccinations). Children were generally seen on an "as needed basis" for acute illnesses.

Most physicians mentioned routine screening, if indicated, for diseases which lead to abnormal development. One suggestion was for the use of the Denver Developmental Test routinely. Most physicians mentioned education concerning nutrition, child care, family planning, and preventive medicine as part of postnatal care.

Again, as in improving prenatal care, education was the most frequently mentioned avenue to better postnatal care. Physicians in general felt that the patient must realize the value and availability of care. Specific suggestions included the use of television, high school courses, and routine post-partum classes in the local hospitals. Other solutions included the use of well-baby clinics, community clinics, public health nurses, increasing the number of physicians, and training nurses or paramedical personnel to go to the rural homes as a kind of "outreach" program.

The problem of patients not keeping postnatal appointments and the problem of educating the consumer concerning the value of postnatal care was again raised as an issue. One pediatrician said,

> "Simply offering them care is not the answer. A large number of the young unwed mothers will not attend a well-baby clinic if offered because of lack of motivation. I find this true of so many of the mothers on SRS subsistence payments, that I see in pediatrics. Obviously the concept of 'welfare' and the fact that 'everything is free' is the least motivating concept of society. It completely destroys pride in an individual and is a vicious circle leading to more and more 'hand-outs'."

> "The people currently on welfare should be completely reevaluated. Those who need help, be given it (but not every-

thing so that they may abuse more). Clinics for the first year of life are useless unless the parents are made to see the purpose behind them and they are willing to accept guidance for the raising of their offspring. Unfortunately, the very people that need it are the least likely to see it and understand why they need it. I wish I knew the answer, but I would certainly like to have the opportunity to 'get through' to some of these mothers."

The problem of the immunization status of Idaho's children was mentioned by several physicians. They indicated that mothers said they would take their children to public health for immunizations rather than pay the higher cost charged by the private physician. The physicians felt, however, that the mothers did not follow through. Some physicians suggested that perhaps immunizations should be given at the physician's office exclusively, and in this way, insuring that more children received their immunizations. Perhaps the Public Health Department could supply the vaccine to them at reduced rates, thus lowering the cost of private immunizations.

Public health people estimate that approximately 60 percent of Idaho's children are immunized through private physicians and 25 percent by public health, leaving about 15 percent unimmunized. This is about the percentage, or slightly more, needed to support an epidemic of polio. Thus there is a need for some means of lowering this number of unimmunized children.

The Clientele Survey conducted by the Idaho Office of Child Development has found that most parents provide fairly adequate health care for their infants. It is after the first year of life when concern drops off.

This is usually evidenced by missing booster immunizations at the 18th month to two-year old age. This information corresponds with that provided by physicians throughout the State. Ninety-three percent of them reported that their patients keep all or most of their appointments during the first year of the child's life.

Several physicians in areas with a large number of migrants commented that they are not in the mainstream of medical care. One physician stated,

> "Usually they are seen for the first time in labor and seldom seen after discharge from the hospital. It is these people who need some sort of routine prenatal care. Perhaps some sort of routine examination form they can take from one physician to another."

Since they do migrate from one section of the country to another, perhaps several times a year, they do not have a chance to become involved in a comprehensive health plan. Perhaps a system could be instituted whereby continuous, comprehensive care might be realized. The key, it seems, is to provide a mechanism that would enable them to readily obtain care anywhere with at least a summary of their individual medical records with them. Perhaps a credit card system could be used whereby migrants could take advantage of medical care no matter where they were. This would probably take national legislation and commitment of additional resources.

Public Vendors

The public health districts throughout the State sponsor well-child conferences and postnatal classes to promote optimal health for preschoolers. In 1970, three thousand six hundred twenty-three children

were seen at well-child conferences; 2,810 in 1971; and 3,480 in 1972. Well-child conferences usually involve activities such as immunizations, nutrition, feeding, bathing, and health check. Some involve additional activities including developmental skill assessment. Those conducted in Northern Idaho provided 41 percent of the AFDC population with well-child services. Unwed mothers may apply for welfare benefits and receive care through delivery. During the 1969-70 biennium an estimated 1,021 applied and received assistance while during the 1971-72 biennium only 868 applied and received services. Assistance due to divorce, during the same time-period, rose from an estimated 1,880 during the first biennium to 2,783 during the 1971-72 biennium. A rather noticeable increase occurred during June and July of 1971. Adoptions completed by the agency rose from 72 (1967-68 biennium) to 329 (1969-70 biennium), to 379 during the last biennium. Hence it appears as though the number of unwed mothers requiring assistance is dropping, the number of adoptive children handled by SRS is stabilizing, and the need for assistance due to divorce is increasing.

Some public agencies including the Child Development Centers and Head Start programs are now beginning to develop infant stimulation programs with parent training components. Most, however, have not been in existence long enough to determine the number being served or the impact of the services. Most of the services provided a child in Idaho during his first year of life are those of his parents and family physician.

SUMMARY

If adequately trained personnel and facilities are available, problems such as toxemia, placenta pervia, abruptio placentae, improper delivery, maternal infections, and prolapse of the cord are less likely to result in an undesirable outcome during labor and delivery. A review of Idaho hospital records during the Prenatal, Perinatal and Postnatal Survey found that a variety of problems do occur in Idaho. A sample of 101 records revealed problems including infections, anemia, hypertension, maternal diabetes, congenital anomalies, leukemia, thyroid dysfunctions, and hypoglycemia. The hospital records also revealed social problems which produce less than desirable outcomes. The problems included suicide attempts, premature births, emotionally upset mothers, and mentally retarded mothers.

The above medical problems can best be documented by individual case review and review of less than optimal outcomes such as mortality and morbidity. A review of Idaho mental retardation case histories has shown that toxicity accounts for 3.5 percent of the cases seen in Idaho clinics. Anoxia at the time of birth accounted for 17.1 percent of the cases seen with identifiable causes. This condition seemed especially high in Northern Idaho (the ten Northern counties) where it accounted for one-fourth of the cases with known causes. Mortality figures indicate that Northern Idaho (the five Northern counties) also has the highest infant and neonatal mortality rate. This information corresponds with the finding that there is a definite lack of consumer care utilization during both the prenatal and postnatal periods in certain areas of Northern Idaho.

The mortality indices themselves provide information concerning only the most drastic outcome - death. Over the years the index has proven fruitful as an indicator; however, now that it is nearing one end of the spectrum, its viability is diminishing. A more desirable index would involve an accounting of the factors leading to a less than optimal outcome. Such an index could be established simultaneously with a high-risk register.

Of the social problems uncovered by the Prenatal, Perinatal, and Postnatal Survey, prematurity represents one of the major concerns. It occurs in about 7 percent of the births to Idahoans and represents a major care problem for physicians and parents. Its major known causes include smoking, toxemia and eclampsia.

The birth of a child to an emotionally disturbed or mentally retarded mother presents an extremely dangerous high-risk situation. Only about 40 percent of the children born to emotionally disturbed women emerge from their rearing environment with wholesome personalities. The cognitive development of a child reared by a mentally retarded mother is at even higher risk.

Certain optimum conditions for child bearing can be defined. They include the following;

1. Both parents planned and desired the pregnancy.
2. The parents are between 20 and 30 years of age.
3. They are of average height, weight, intelligence and affluence.
4. There is no previous history of reproductive failure.
5. No medical disease or infections are present.
6. Births are not spaced too close.
7. There have not been more than four births to the mother.

One must remember that these are associative or correlative features of optimal outcomes and not necessarily cause and effect factors. They appear to be a mixture of medical and social considerations.

Social factors such as illegitimacy, parental deprivation, neglect, abuse, and deprivation of affection all seem to provide environments which fail to optimize the child's development. To a certain extent the influences of these factors can be measured.

The major consequences of illegitimacy have been reviewed. Associated with the occurrence of illegitimacy are consequences such as depending upon welfare payments, reduced probability of a meaningful child-father relationship, reduced marital stability, and a less favorable environment of emotional-social development. When illegitimacy occurs, a child's prospects for adequate care are mostly limited by his mother's ethnic background and her financial resources.

The consequences of parental deprivation due to divorce, separation, and accidental death are demonstrable. They seem to center around later social-emotional dysfunctioning. The major impact of loss seems to occur prior to seven years of age.

Both abuse and neglect present major problems which are not frequent enough in occurrence to catch general public attention. In Idaho, it is estimated that each year between 120-240 children are abused by their parents (or surrogate) and that of these about four die of injuries received during the battering. The consequences of abuse are detrimental to the child and society. An abused child has a ten to one-hundred times greater probability of being institutionalized than his non-abused peer. For him, death, also has a probability 20 times that of his peers.

Idaho SRS data was analyzed and revealed the following findings:

1. Only one-fourth to one-half of the abuse cases are being reported each year.

2. The missing cases are probably very young children - those least able to help themselves; hence, the most vulnerable.

The consequences of neglect and emotional deprivation have been reviewed. Retardation in motor, language and intellectual development have been demonstrated. Malnutrition and high infant mortality rates are indicators of its occurrence. Behavioral characteristics such as stereotype movements, lack of interest, passivity, and apathy are associated with neglect and emotional deprivation. Consequences in later life may include mental retardation, emotional instability, institutionalization, etc. Neglect and emotional deprivation are, in part, the root causes for later socially maladaptive behavior.

Language constitutes one of the basic skills involved in the measurement of intelligence. Consequently, language development has become one of the major focal points of early childhood development. Optimal support for learning development at nine months of age is necessary because prelinguistic sounds begin to be modified into language at this point. It should be noted that, from about six months of age on, this is also true of emotional development. Environments which do not support optimal language development include those where mentally retarded parents, deaf parents, and bilingual parents are the primary speech model. While actual differences in language development do not appear until about nine months some evidence has been presented which would indicate that support is needed as early as two months of age.

Motor development appears not to know any SES differences. An early lag in motor development is a good indicator of a neurologically

injured child and calls for immediate intervention.

Malnutrition is associated with many factors including poverty and neglect. The consequences are reduced intellectual functioning especially if the nutritional deprivation occurred during the first two years of life. The severity of deprivation seems to be directly associated with the extent of intellectual impairment. Americans, in general, seem to be making poor dietary choices which are reflected in indicators such as abnormal hemoglobin levels, etc. Severe dietary restrictions includes conditions known as marasmus and kwaskiorkor. An estimate based upon Boise hospital admissions would indicate that perhaps up to 20 such cases are seen each year in Idaho.

Physicians throughout the State identified teenagers, migrants, and SRS clients as those least likely to utilize postnatal care services. Suggestions for improved participation were many and varied. They included increasing the absolute number of physicians, using paraprofessionals, establishing clinics, developing satellite clinics, using a credit card system for migrants, etc.

One specific problem concerning the general population of preschoolers is the low level of immunizations. The problem appears to be a linkage between the vendors of immunizations and the consumer. Optimal delivery methods have probably not been developed, and immunization is low on the consumer's priority list.

Public vendors are beginning to focus in on some of the aforementioned problems. In Idaho, Public Health Departments and Child Development Centers seem to be leading the way. Activities such as well-child conferences, infant stimulation programs, parent training, immunization

clinics, etc., are providing approaches to some of the problems. It is anticipated that perhaps Head Start programs will also begin to provide some of the necessary services in the near future. All of this activity points to the need for well-organized community program planning and development in the area of early childhood.

RECOMMENDATIONS

To promote the optimal environment for the development of children in the State of Idaho the following recommendations are made concerning preconceptional services:

1. That the State develop or help develop services involving genetic counseling and diagnosis. Genetic services if made part of an already existing system, such as Oregon's, would not be extensive in cost and could be provided for everyone on a sliding fee scale basis. It would seem wise to develop this service because of its tremendous potential impact upon the quality of life in future years.
2. That the State develop a monitoring system by modification of birth certificate information, to determine pockets of low (less than desirable) preconceptional care and upon its detection initiate appropriate intervention. Intervention strategies could include, public education, public clinics or a voucher system to provide the care through private physicians, or private physicians themselves activating a system to ameliorate the problem.
3. That the State initiate an all out campaign to promote responsible parenthood. This could include public education both within the school system and through other educational mechanisms such as the family, church, community groups, educational TV, and other public agencies. That such education

be made available for all and involve considerations as follows:

a. Economic and time commitment involved in child bearing and rearing.

b. Family size and its potential impact through time upon the physical environment and the greater social organization.

c. Optimal conditions for conception and prenatal development of the embryo and fetus.

d. Optimal postnatal environmental considerations including those which determine social, emotional, physical and intellectual growth.

e. Community resources available for promoting the development of children and families.

In order that we begin to promote the optimal environment for the development of children in the State of Idaho the following recommendations are made concerning prenatal services.

1. That the State develop a monitoring system by modification of birth certificate information, to determine pockets of low prenatal care delivery and upon their detection initiate appropriate intervention. Such intervention could include public education, public prenatal clinics or a voucher system to provide the care through private physicians or private physicians themselves activating a system to ameliorate the problem.

2. That the State develop an adequate mechanism for the analysis of prenatal conditions leading to less than optimal outcomes and make this information (in summation form) be made available to private physicians throughout the State. Once this has been accomplished appropriate action can be taken through a variety of already existing organizations.

In order to promote the optimal environment for the development of children in the State of Idaho the following recommendations are made concerning delivery and postnatal care services.

1. That the State develop a monitoring system by modification of the Birth Certificate to identify high-risk children and that this information be used in four ways.

    a. As a social indicator to monitor the progress toward an optimal outcome for each child.

    b. As a feedback mechanism for physicians practicing within the State. This mechanism would enable them to review nonoptimal outcomes and promote appropriate goal oriented procedures to ameliorate the barriers leading to optimal outcomes.

    c. As a feedback mechanism for State sponsored Health Clinics.

    d. This monitoring would provide an initial screening mechanism upon which home-based child development programs for potentially handicapped children could depend for their initial programatic input of high-risk infants.

    e. The monitoring mechanism would provide a method of identifying 50 percent or more to the children who will ultimately be handicapped. By follow-up screening through the Early Periodic Screening, Diagnosis, and Treatment (EPSDT) mechanism those showing signs of lag could be provided adequate programming at a nominal cost.

2. That programs appropriate to the development of high-risk infants be initiated, and that these programs be home-based when the family unit shows sufficient strength and resources to enhance the infant's development. If this is not the case, surrogate parents can be wholly or partially used.

3. That the linkage between the consumer and the vendor of immunization be improved so that at least 85 percent of the infants are up-to-date on their immunizations.

4. That child protective services be improved throughout the State by changing the enabling legislation, experimenting with service delivery systems and improving public awareness.

5. That the State develop and use a monitoring system for children composed of the following social indicators to cover pre-conceptional, prenatal, neonatal, and infancy concerns:

   a. Percent using preconceptional exam services.
   b. Percent using genetic counseling services.
   c. Percent receiving prenatal care during the first and third trimester of pregnancy.
   d. Ratio of abortions to live births.
   e. Neonatal deaths (one day and six days).
   f. Number of children placed for adoption.
   g. Infant deaths.
   h. Premature infants.
   i. Infants at risk by factors and combinations of factors involved.
   j. Percent of the population immunized.
   k. Percent and type of infant neglect and abuse.
   l. An infant morbidity index.
   m. An index of illegitimacy and percentage of unwed mothers keeping their child.
   n. A nutritional index.

6. That the State expand the EPSDT program now initiated under Title XIX , making it available to all children. The program would provide 0-6 year old children with comprehensive screening, diagnosis and treatment program. Such a program could be initiated using a sliding fee scale based upon need. Elements of the program include visual; auditory; dental; medical; social intellectual and motor development; and nutritional.

The following charts show the needs, services, and monitoring systems necessary to provide (in part) an optimal environment for child development. It is not intended to be complete but to represent

those critical points along the life spectrum of the child where special attention should be given to optimizing the environment. The spectrum of services is by no means complete but represents some of our knowledge concerning cause and effect relationships where prevention or early intervention can have a substantial impact upon the well-being of children.

PRECONCEPTIONAL CONSIDERATIONS

NEEDS	Knowledge of health and social optimums for child-bearing and child rearing	Knowledge of family tree and possible hereditary impact upon the child	Conception planned and wanted by both parents	Potential mother free of disease and protected from disease
SERVICES	Preparent training programs	Genetic counseling and diagnosis	Family Planning	Preconceptional examination
MONITORING				
Input	Head count	Head count	Head count	Head count
Process	Content review Knowledge acquisition Consumer comment	Peer review Content review Consumer comment	Peer review Consumer comment	Medical peer review
Output	Measurement of outcome objectives, including utilization of services and reduction of non-optional outcomes - may use control group and risk register	Reduction in outcomes that involve genetic defects or have high risk genetic components	Reduction in abortion requests, illegitimacy, adoption, and neglected children. Fewer children born under non-optimal conditions such as maternal age	Increase in ratio of pregnancies under optimal conditions

PRENATAL CONSIDERATIONS

NEEDS	To be wanted and healthy		
SERVICES	1st Trimester	2nd Trimester	3rd Trimester
	Family history	Dental care	Dental care
	Physical examination	Maternal weight gain	Maternal weight gain
	Lab work including	Lab work	Rh check
	Rh test	Fetal growth	X-ray
	Nutritional counseling	Induced abortion	Fetal growth
	Induced abortion	Social counseling	Lab work
	Social counseling	Amniocentesis	
	Amniocentesis		
MONITORING			
Input	Head count	Head count	Head count
Process	Medical peer review	Medical peer review	Medical peer review
Output	Fewer outcomes involving early risk and detrimental conditions	Fewer outcomes involving unwanted children, those under high-risk situations and detrimental conditions	Fewer coutcomes involving unwanted children, those under high-risk situations and detrimental conditions

NEONATAL AND INFANCY CONSIDERATIONS

NEEDS	Adequate delivery and neonatal environment	Wanted	Nourishment	Healthy	Stimulated
SERVICES	Hospital maternal and infant care	Adoption, abuse and neglect, prevention and intervention	Nutritional counseling	Immunizations and regular visits to physicians	Early stimulation programs for children at risk
MONITORING					
Input	Percent born in hospitals	Ratio to live births or peers	Head count of target population (s)	Percent of population immunized	Percent served
Process	Medical peer review	Review of linkage factors in view of outcomes	Peer review Knowledge gained Consumer rating	Peer review Consumer comment	Peer review Consumer comment
Output	Fewer neonatal deaths and incidents involving morbidity (high-risk)	Number of optional placements as reviewed five years later Reduction in occurrence of abuse and neglect and illegitimacy	Fewer mal-nourished children as determined by height, weight, hematocrats, etc.	Reduction of occurrence of immunizable diseases and other prevent-able diseases. Infant deaths and morbidity	Reduction in strength (or prevention of) dehabilitative handicaps

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